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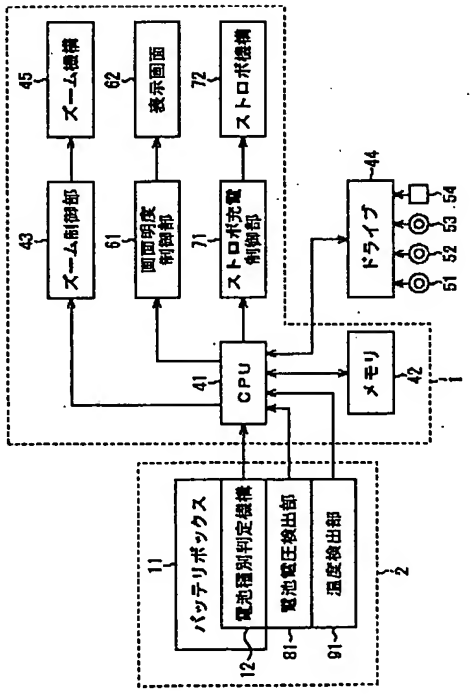
(54)【発明の名称】電子装置および制御方法、記録媒体、並びにプログラム

(57)【要約】
【課題】　バッテリの種類により動作条件を変更するようにする。
【解決手段】電池種別判定機構１２は、バッテリボックス１１に収納されている電池の種別を判定し、判定結果をCPU４１に供給する。電池電圧検出部８１は、電池の電圧を検出し、検出電圧をCPU４１に供給する。温度検出部９１は、電池の周囲温度を検出し、検出温度をCPU４１に供給する。CPU４１は、電池の種別、検出温度、および検出温度に応じて、メモリから対応するズームスピード設定値を読み出してズーム制御部４３に供給し、ズーム機構４５のズームスピードを制御させるようにしたり、明度設定値を読み出して画面明度制御部６１に供給し、表示画面６２の明度を制御させるようにしたり、ストロボ充電時間設定値を読み出してストロボ充電制御部７１に供給し、ストロボ機構７２のストロボ充電時間を制御させる。本発明は、バッテリにより駆動する撮像装置に適用できる。

図19



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【特許請求の範囲】

【請求項１】　電力供給装置により駆動する電子装置において、

前記電力供給装置から供給される、電池の種別を識別する信号を取得する取得手段と、

前記取得手段により取得された前記信号に基づいて、前記電池の種別を判定する判定手段と、

前記判定手段による判定結果に基づいて、前記電子装置の所定の動作を制御する制御手段とを備えることを特徴とする電子装置。

【請求項２】　前記制御手段は、前記電子装置のズームスピード、前記電子装置の画面の明度、または、前記電子装置のストロボ充電時間のうち、少なくとも１つを変化させるように制御することを特徴とする請求項１に記載の電子装置。

【請求項３】　前記電力供給装置から供給される、前記電池の電圧を検出する電圧検出手段をさらに備え、

前記制御手段は、前記判定手段による判定結果、および、前記電圧検出手段による電圧検出結果に基づいて、前記電子装置の所定の動作を制御することを特徴とする請求項１に記載の電子装置。

【請求項４】　前記電力供給装置から供給される、前記電池の周囲温度を検出する温度検出手段をさらに備え、

前記制御手段は、前記判定手段による判定結果、および、前記温度検出手段による温度検出結果に基づいて、前記電子装置の所定の動作を制御することを特徴とする請求項１に記載の電子装置。

【請求項５】　前記電力供給装置から供給される、前記電池の電圧を検出する電圧検出手段と、

前記電力供給装置から供給される、前記電池の周囲温度を検出する温度検出手段とをさらに備え、

前記制御手段は、前記判定手段による判定結果、前記電圧検出手段による電圧検出結果、および、前記温度検出手段による温度検出結果に基づいて、前記電子装置の所定の動作を制御することを特徴とする請求項１に記載の電子装置。

【請求項６】　前記所定の動作を制御するための条件情報を記憶する記憶手段をさらに備え、

前記制御手段は、前記判定手段による判定結果に基づいて、前記記憶手段に記憶されている前記条件情報を読み出し、読み出した前記条件情報に基づいて、前記電子装置の所定の動作を制御することを特徴とする請求項１に記載の電子装置。

【請求項７】　電力供給装置により駆動する電子装置の制御方法において、前記電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、

前記取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、

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前記判定ステップの処理による判定結果に基づいて、前記電子装置の所定の動作を制御する制御ステップとを含むことを特徴とする制御方法。

【請求項８】　電力供給装置により駆動する電子装置を制御するプログラムであって、

前記電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、

前記取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、

前記判定ステップの処理による判定結果に基づいて、前記電子装置の所定の動作を制御する制御ステップとを含むことを特徴とするコンピュータが読み取り可能なプログラムが記録されている記録媒体。

【請求項９】　電力供給装置により駆動する電子装置を制御するコンピュータに、

前記電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、

前記取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、

前記判定ステップの処理による判定結果に基づいて、前記電子装置の所定の動作を制御する制御ステップとを実行させる。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、電子装置および制御方法、記録媒体、並びにプログラムに関し、特に、例えば、電子装置に装着されるバッテリの種類に応じて、所定の動作を制御するようにした電子装置および制御方法、記録媒体、並びにプログラムに関する。

【０００２】

【従来の技術】従来、２本の単３型電池を電力源とするバッテリ駆動型電子装置では、様々な種類の電池を使用することが可能である。

【０００３】単３型電池の場合には、例えば、２本のアルカリ電池、２本のニッケル一次電池、または２本のニッケル二次電池などを使用することができる。またボックス型電池の場合には、例えば、リチウム一次電池、またはリチウム二次電池などを使用することができる。

【０００４】

【発明が解決しようとする課題】しかしながら、これらの電池の電力容量および特性には大きな差がある。例えば、２本のアルカリ単３型電池とリチウム一次電池とでは、電力容量、低温時でのインピーダンス、および電池電圧減少時のインピーダンス特性に大きな差がある。

【０００５】すなわち、電池の特性の差が大きいにも拘わらず、現在のバッテリ駆動型電子装置では、バッテリの種類に関係なく、常に同じ条件で動作している。そのため、リチウム一次電池のように、高容量および低イン

ビーダンスのバッテリであっても、そのメリットを最大限に引き出すことができない課題があった。

【０００６】本発明はこのような状況に鑑みてなされたものであり、バッテリの種類により電子装置の動作条件を変更することができるようにするものである。

【０００７】

【課題を解決するための手段】本発明の電子装置は、電力供給装置から供給される、電池の種別を識別する信号を取得する取得手段と、取得手段により取得された信号に基づいて、電池の種別を判定する判定手段と、判定手段による判定結果に基づいて、電子装置の所定の動作を制御する制御手段とを備えることを特徴とする。

【０００８】制御手段には、電子装置のズームスピード、電子装置の画面の明度、または、電子装置のストロボ充電時間のうち、少なくとも１つを変化させるように制御させることができる。

【０００９】電力供給装置から供給される、電池の電圧を検出する電圧検出手段をさらに設けるようにすることができ、制御手段には、判定手段による判定結果、および、電圧検出手段による電圧検出結果に基づいて、電子装置の所定の動作を制御させるようにすることができる。

【００１０】電力供給装置から供給される、電池の周囲温度を検出する温度検出手段をさらに設けるようにすることができ、制御手段には、判定手段による判定結果、および、温度検出手段による温度検出結果に基づいて、電子装置の所定の動作を制御させるようにすることができる。

【００１１】電力供給装置から供給される、電池の電圧を検出する電圧検出手段と、電力供給装置から供給される、電池の周囲温度を検出する温度検出手段とをさらに設けるようにすることができ、制御手段には、判定手段による判定結果、電圧検出手段による電圧検出結果、および、温度検出手段による温度検出結果に基づいて、電子装置の所定の動作を制御させるようにすることができる。

【００１２】所定の動作を制御するための条件情報を記憶する記憶手段をさらに設けるようにすることができ、制御手段には、判定手段による判定結果に基づいて、記憶手段に記憶されている条件情報を読み出させ、読み出させた条件情報に基づいて、電子装置の所定の動作を制御させるようにすることができる。

【００１３】本発明の制御方法は、電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、判定ステップの処理による判定結果に基づいて、電子装置の所定の動作を制御する制御ステップとを含むことを特徴とする。

【００１４】本発明の記録媒体に記録されているプログラムは、電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、判定ステップの処理による判定結果に基づいて、電子装置の所定の動作を制御する制御ステップとを含むことを特徴とする。

【００１５】本発明のプログラムは、電力供給装置から供給される、電池の種別を識別する信号の取得を制御する取得制御ステップと、取得制御ステップの処理により取得が制御された前記信号に基づいて、前記電池の種別を判定する判定ステップと、判定ステップの処理による判定結果に基づいて、電子装置の所定の動作を制御する制御ステップとをコンピュータに実行させる。

【００１６】本発明の電子装置および制御方法、並びにプログラムにおいては、電力供給装置から供給される、電池の種別を識別する信号が取得され、取得された信号に基づいて、電池の種別が判定され、その判定結果に基づいて、電子装置の所定の動作が制御される。

【００１７】

【発明の実施の形態】以下、図を参照して、本発明の実施の形態について説明する。

【００１８】図１は、本発明を適用した撮像装置１とバッテリ２の接続例を示す図である。

【００１９】撮像装置１は、例えば、スチルカメラ、デジタルカメラ、またはカムコーダなどで構成される撮像機器であって、装着されているバッテリ２の電池の種別に応じて、ズーム機構４５（図４）のズームスピード、表示画面６２（図７）の明度、またはストロボ機構７２（図１０）のストロボ充電時間などを変化させる。

【００２０】バッテリ２は、同図に示されるように、撮像装置１の図示せぬ装着部に装着されており、撮像装置１に電力を供給するものである。

【００２１】図２は、バッテリ２の構成例を示す図である。図２Ａは、バッテリ２の外観斜視図を示しており、図２Ｂは、図２Ａの矢印Ｐ方向から見た側面断面図を示している。

【００２２】バッテリ２は、電池２１－１，２１－２を収納するためのバッテリボックス（電池収納機構）１１、および電池の種類を判別するための電池種別判定機構１２で構成されている。電池種別判定機構１２はさらに、可動しきい１３、ばね１４、および電池検出スイッチ１５で構成されている。

【００２３】可動しきい１３は、ばね１４で支えられており、図２Ｂ中、下方向に可動可能になされている。電池検出スイッチ１５は、ばね１４を介して可動しきい１３に接続されている。通常、電池検出スイッチ１５は、オフの状態であるが、可動しきい１３が下方向に可動されると、ばね１４が伸縮し、電池検出スイッチ１５を押圧しようとする力（付勢力）が働く。このように、電池

検出スイッチ１５は、ばね１４の付勢力を利用して、スイッチがオンされる。電池検出スイッチ１５は、スイッチのオン／オフ（ON/OFF）信号を撮像装置１に供給する。

【００２４】単３型電池２１－１，２１－２は、アルカリ電池、ニッケル一次電池、またはニッケル二次電池などで構成されており、図２Ａの点線矢印に示されるように、バッテリボックス１１に収納される。この場合、単３型電池２１－１，２１－２は、可動しきい１３を挟んでバッテリボックス１１に収納されるため、可動しきい１３は、図２Ｂ中の下方向に可動されることはない。すなわち、単３型電池２１－１，２１－２がバッテリボックス１１に収納された場合には、電池検出スイッチ１５はオフの状態のままである。

【００２５】図３は、バッテリ２の他の構成例を示す図である。図３Ａは、バッテリ２の外観斜視図を示しており、図３Ｂは、図３Ａの矢印Ｑ方向から見た側面断面図を示している。なお、図２と対応する部分には、同一の符号を付してあり、その説明は適宜省略する。

【００２６】ボックス型電池３１は、単３型電池の２本分の幅を有するリチウム一次電池、またはリチウム二次電池などで構成されており、図３Ａの点線矢印に示されるように、バッテリボックス１１に収納される。この場合、ボックス型電池３１がバッテリボックス１１に収納されることで、可動しきい１３が図３Ｂ中の下方向に可動される。すなわち、ボックス型電池３１がバッテリボックス１１に収納された場合には、電池検出スイッチ１５はオンの状態に遷移する。

【００２７】図４は、図１に示した撮像装置１とバッテリ２の内部の構成例を示す図である。

【００２８】CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、装着されている電池の種類を判別する。CPU４１は、判別結果に基づいて、メモリ４２を参照し、対応するズームスピード設定値（図５）を読み出し、ズーム制御部４３に供給する。

【００２９】メモリ４２には、電池種別に応じたズーム機構４５のズームスピード設定値のテーブルが予め格納されている。またメモリ４２は、CPU４１が使用するプログラムや演算用のパラメータのうちの基本的に固定のデータを格納したり、あるいは、プログラムの実行において適宜変化するパラメータなどを格納するようにしてもよい。

【００３０】ここで図５を参照して、メモリ４２に記録されているズームスピード設定値のテーブルの例について説明する。同図に示されるように、電池検出スイッチ１５から供給される検出信号に対応付けて、ズームスピード設定値が格納されている。

【００３１】図５の例においては、「OFF」の検出信号に対応して、「A1（遅い）」のズームスピード設定値（秒）が記録され、「ON」の検出信号に対応して、「A2（速い）」のズームスピード設定値（秒）が記録されている。

【００３２】なお、メモリ４２には、「A1」および「A2」の時間を所定の算出方法で変換した値を格納させるようにしてもよい。

【００３３】図４の説明に戻る。ズーム制御部４３は、CPU４１から供給されたズームスピード設定値に基づいて、ズーム機構４５のズームスピードを変更するように制御する。

【００３４】CPU４１にはまた、必要に応じてドライブ４４が接続され、ドライブ４４には、磁気ディスク５１、光ディスク５２、光磁気ディスク５３、または半導体メモリ５４などが必要に応じて装着される。ドライブ４４は、磁気ディスク５１、光ディスク５２、光磁気ディスク５３、または半導体メモリ５４に記録されているデータまたはプログラムを読み出して、そのデータまたはプログラムを、CPU４１またはメモリ４２に供給する。

【００３５】以下、メモリ４２には、電池種別に応じたズームスピード設定値のテーブルが予め格納されているものとして説明するが、これに限らず、CPU４１にドライブ４４を接続させ、ドライブ４４に、磁気ディスク５１、光ディスク５２、光磁気ディスク５３、または半導体メモリ５４を装着させ、それらに記録されているズームスピード設定値のテーブルを読み出させて、メモリ４２に格納させるようにしてもよい。

【００３６】ところで、撮像装置１において、ズーム機構４５をより速いズームスピードで駆動させるためには、短時間に、より大きい電力が必要になる。すなわち、電池性能が劣る場合に、速いズームスピードで駆動させようとすると電池の寿命が悪化する。

【００３７】図３に示したボックス型電池３１は、図２に示した単３型電池２１－１，２１－２よりも電池容量が大きく、バッテリインピーダンスが小さいため、単３型電池使用時よりも、より速いズームスピードでズーム機構４５を駆動させたとしても、電池の寿命に与える影響が少ない。

【００３８】そこで、図４に示した撮像装置１では、電池検出スイッチ１５から供給される検出信号がオン信号の場合（ボックス型電池３１の使用時）、より速いズームスピードでズーム機構４５が駆動され、検出信号がオフ信号の場合（単３型電池２１－１，２１－２の使用時）、通常のスピード（またはボックス型電池３１の使用時のズームスピードより遅いスピード）でズーム機構４５が駆動されるようにする。

【００３９】次に、図６のフローチャートを参照して、図４の撮像装置１が実行するズームスピード制御処理について説明する。この処理を開始するにあたり、撮像装置１には、バッテリ２が装着されているものとし、バッ

テリ２の電池種別判定機構１２の電池検出スイッチ１５から検出信号が供給されているものとする。

【００４０】ステップＳ１において、撮像装置１のCPU４１は、電池検出スイッチ１５から供給されてきた検出信号がオン信号であるか、またはオフ信号であるか否かを判別する。ステップＳ２において、CPU４１は、ステップＳ１の処理による判別結果に基づいて、メモリ４２を参照し、対応するズームスピード設定値（図５）を読み出し、ズーム制御部４３に供給する。

【００４１】例えば、検出信号がオフ信号であった場合（単３型電池２１－１，２１－２の使用時）、「A1（遅い）」のズームスピード設定値（秒）が読み出され、検出信号がオン信号であった場合（ボックス型電池３１の使用時）、「A2（速い）」のズームスピード設定値（秒）が読み出される。

【００４２】ステップＳ３において、ズーム制御部４３は、CPU４１から供給されたズームスピード設定値に基づいて、ズーム機構４５のズームスピードを制御する。

【００４３】例えば、CPU４１から「A1（遅い）」のズームスピード設定値（秒）が供給された場合、「A1（秒）」のズームスピードでズーム機構４５が駆動される。また例えば、CPU４１から「A2（速い）」のズームスピード設定値（秒）が供給された場合、「A2（秒）」のズームスピードでズーム機構４５が駆動される。なお、消費電力の関係は、A1＜A2となる。

【００４４】このように、撮像装置１は、バッテリ２のバッテリボックス１１に収納されている電池の種類を判別し、ボックス型電池３１の使用時には、単３型電池２１－１，２１－２の使用時よりも、より速いズームスピードでズーム機構４５を駆動させることが可能になる。

【００４５】また、撮像装置１は、バッテリ２のバッテリボックス１１に収納されている電池の種類に応じて、ズーム機構４５のズームスピードを変更するように制御するだけでなく、例えば、表示画面の明度やストロボ充電時間など、他の動作条件も変更するように制御することができる。以下、他の動作条件を変更するように制御する場合の構成例およびその動作について、順に説明することにする。

【００４６】図７は、図１に示した撮像装置１とバッテリ２の他の内部の構成例を示す図である。なお、図４と対応する部分には、同一の符号を付してあり、その説明は適宜省略する。

【００４７】メモリ４２には、電池種別に応じた表示画面６２の明度設定値のテーブルが予め格納されている。勿論、CPU４１にドライブ４４を接続させ、ドライブ４４に、磁気ディスク５１、光ディスク５２、光磁気ディスク５３、または半導体メモリ５４を装着させ、それらに記録されている明度設定値のテーブルを読み出させて、メモリ４２に格納させるようにしてもよい。

【００４８】ここで図８を参照して、メモリ４２に記録されている明度設定値のテーブルの例について説明する。同図に示されるように、電池検出スイッチ１５から供給される検出信号に対応付けて、明度設定値が格納されている。

【００４９】図８の例においては、「OFF」の検出信号に対応して、「B1（暗い）」の明度設定値（cd/m^2）が記録され、「ON」の検出信号に対応して、「B2（明るい）」の明度設定値（cd/m^2）が記録されている。

【００５０】なお、メモリ４２には、「B1」および「B2」の明るさを所定の算出方法で変換した値を格納させるようにしてもよい。

【００５１】図８の説明に戻る。CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、装着されている電池の種類を判別する。CPU４１は、判別結果に基づいて、メモリ４２を参照し、対応する明度設定値（図８）を読み出し、画面明度制御部６１に供給する。

【００５２】画面明度制御部６１は、CPU４１から供給された明度設定値に基づいて、表示画面６２の明度を変更するように制御する。

【００５３】表示画面６２は、液晶表示装置などの薄型の表示装置で構成され、CPU４１からデータを受信し、受信したデータに対応する画像または文字などを表示する。

【００５４】ところで、撮像装置１において、表示画面６２をより明るく表示させるためには、より大きい電力が必要になる。すなわち、電池性能が劣る場合に、表示画面６２を明るく表示させようとすると電池の寿命が悪化する。

【００５５】図３に示したボックス型電池３１は、上述したように、図２に示した単３型電池２１－１，２１－２よりも電池容量が大きく、バッテリインピーダンスが小さいため、単３型電池使用時よりも、より明るく表示画面６２を表示させたとしても、電池の寿命に与える影響が少ない。

【００５６】そこで、図７に示した撮像装置１では、電池検出スイッチ１５から供給される検出信号がオン信号の場合（ボックス型電池３１の使用時）、より明るく表示画面６２が表示され、検出信号がオフ信号の場合（単３型電池２１－１，２１－２の使用時）、通常の明るさで（またはボックス型電池３１の使用時の明るさより暗く）表示画面６２が表示されるようにする。

【００５７】次に、図９のフローチャートを参照して、図７の撮像装置１が実行する画面明度制御処理について説明する。この処理を開始するにあたり、撮像装置１には、バッテリ２が装着されているものとし、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から検出信号が供給されているものとする。

【００５８】ステップＳ１１において、撮像装置１のCPU４１は、電池検出スイッチ１５から供給されてきた検

出信号がオン信号であるか、またはオフ信号であるか否かを判別する。ステップＳ１２において、CPU４１は、ステップＳ１１の処理による判別結果に基づいて、メモリ４２を参照し、対応する明度設定値（図８）を読み出し、画面明度制御部６１に供給する。

【００５９】例えば、検出信号がオフ信号であった場合（単３型電池２１－１，２１－２の使用時）、「B1（暗い）」の明度設定値（cd/m²）が読み出され、検出信号がオン信号であった場合（ボックス型電池３１の使用時）、「B2（明るい）」の明度設定値（cd/m²）が読み出される。

【００６０】ステップＳ１３において、画面明度制御部６１は、CPU４１から供給された明度設定値に基づいて、表示画面６２の明度を制御する。

【００６１】例えば、CPU４１から「B1（暗い）」の明度設定値（cd/m²）が供給された場合、「B1（cd/m²）」の明るさで表示画面６２が表示される。また例えば、CPU４１から「B2（明るい）」の明度設定値（cd/m²）が供給された場合、「B2（cd/m²）」の明るさで表示画面６２が表示される。なお、消費電力の関係は、B1<B2となる。

【００６２】このように、撮像装置１は、バッテリ２のバッテリボックス１１に収納されている電池の種類を判別し、ボックス型電池３１の使用時には、単３型電池２１－１，２１－２の使用時よりも、より明るく表示画面６２を表示させることが可能になる。

【００６３】図１０は、図１に示した撮像装置１とバッテリ２の他の内部の構成例を示す図である。なお、図４と対応する部分には、同一の符号を付してあり、その説明は適宜省略する。

【００６４】メモリ４２には、電池種別に応じたストロボ機構７２のストロボ充電時間設定値のテーブルが予め格納されている。勿論、CPU４１にドライブ４４を接続させ、ドライブ４４に、磁気ディスク５１、光ディスク５２、光磁気ディスク５３、または半導体メモリ５４を装着させ、それらに記録されているストロボ充電時間設定値のテーブルを読み出させて、メモリ４２に格納させるようにしてもよい。

【００６５】ここで図１１を参照して、メモリ４２に記録されているストロボ充電時間設定値のテーブルの例について説明する。同図に示されるように、電池検出スイッチ１５から供給される検出信号に対応付けて、ストロボ充電時間設定値が格納されている。

【００６６】図１１の例においては、「OFF」の検出信号に対応して、「C1（遅い）」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号に対応して、「C2（速い）」のストロボ充電時間設定値（秒）が記録されている。

【００６７】なお、メモリ４２には、「C1」および「C2」の時間を所定の算出方法で変換した値を格納させるようにしてもよい。

【００６８】図１０の説明に戻る。CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、バッテリボックス１１に収納されている電池の種類を判別する。CPU４１は、判別結果に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１１）を読み出し、ストロボ充電制御部７１に供給する。

【００６９】ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボコンデンサ（図示せず）の充電時間を変更するように制御する。

【００７０】ところで、撮像装置１において、ストロボ機構７２のストロボコンデンサをより速く充電するためには、短時間に、より大きい電力が必要になる。すなわち、電池性能が劣る場合に、ストロボ充電時間を短くしようとすると電池の寿命が悪化する。

【００７１】図３に示したボックス型電池３１は、上述したように、図２に示した単３型電池２１－１，２１－２よりも電池容量が大きく、バッテリインピーダンスが小さいため、単３型電池使用時よりも、より短い時間でストロボ充電をしたとしても、電池の寿命に与える影響が少ない。

【００７２】そこで、図１０に示した撮像装置１では、電池検出スイッチ１５から供給される検出信号がオン信号の場合（ボックス型電池３１の使用時）、より短い充電時間でストロボ機構７２のストロボコンデンサが充電され、検出信号がオフ信号の場合（単３型電池２１－１，２１－２の使用時）、通常の充電時間（またはボックス型電池３１の使用時の充電時間より長い時間）でストロボ機構７２のストロボコンデンサが充電されるようにする。

【００７３】次に、図１２のフローチャートを参照して、図１０の撮像装置１が実行するストロボ充電時間制御処理について説明する。この処理を開始するにあたり、撮像装置１には、バッテリ２が装着されているものとし、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から検出信号が供給されているものとする。

【００７４】ステップＳ２１において、撮像装置１のCPU４１は、電池検出スイッチ１５から供給されてきた検出信号がオン信号であるか、またはオフ信号であるか否かを判別する。ステップＳ２２において、CPU４１は、ステップＳ２１の処理による判別結果に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１１）を読み出し、ストボロ充電制御部７１に供給する。

【００７５】例えば、検出信号がオフ信号であった場合（単３型電池２１－１，２１－２の使用時）、「C1（遅い）」のストロボ充電時間設定値（秒）が読み出され、検出信号がオン信号であった場合（ボックス型電池３１

の使用時）、「C2（速い）」のストロボ充電時間設定値（秒）が読み出される。

【００７６】ステップＳ２３において、ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボ充電時間を制御する。

【００７７】例えば、CPU４１から「C1（遅い）」のストロボ充電時間設定値（秒）が供給された場合、「C1（秒）」の充電時間でストロボ機構７２のストロボコンデンサが充電される。また例えば、CPU４１から「C2（速い）」のストロボ充電時間設定値（秒）が供給された場合、「C2（秒）」の充電時間でストロボ機構７２のストロボコンデンサが充電される。なお、消費電力の関係は、C1<C2となる。

【００７８】このように、撮像装置１は、バッテリ２のバッテリボックス１１に収納されている電池の種類を判別し、ボックス型電池３１の使用時には、単３型電池２１－１，２１－２の使用時よりも、より短い充電時間でストロボ機構７２のストロボコンデンサを充電することが可能になる。

【００７９】図１３は、図１に示した撮像装置１のバッテリ２の他の内部の構成例を示す図である。なお、図１０と対応する部分には、同一の符号を付してあり、その説明は適宜省略する。図１３の例の場合、バッテリ２に、電池電圧検出部８１が新たに設けられている以外は、図１０と同様の構成とされる。

【００８０】電池電圧検出部８１は、バッテリボックス１１に収納されている電池の電圧を検出し、電池電圧情報（検出電圧）を撮像装置１に供給する。

【００８１】メモリ４２には、電池種別および電池電圧情報に応じたストロボ機構７２のストロボ充電時間設定値のテーブルが予め格納されている。

【００８２】ここで図１４を参照して、メモリ４２に記録されているストロボ充電時間設定値のテーブルの例について説明する。同図に示されるように、電池検出スイッチ１５から供給される検出信号および電池電圧検出部８１から供給される電池電圧情報（検出電圧）に対応付けて、ストロボ充電時間設定値が格納されている。なお、Vbattは検出電圧を表わし、Vthは所定の閾値の電圧を表わしている。

【００８３】図１４の例においては、「OFF」の検出信号、および「Vbatt≧Vth」の検出電圧に対応して、「D1」のストロボ充電時間設定値（秒）が記録され、「OFF」の検出信号、および「Vbatt<Vth」の検出電圧に対応して、「D2」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号、および「Vbatt≧Vth」の検出電圧に対応して、「D3」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号、および「Vbatt<Vth」の検出電圧に対応して、「D4」のストロボ充電時間設定値（秒）が記録されている。

【００８４】図１３の説明に戻る。CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、バッテリボックス１１に収納されている電池の種類を判別し、電池電圧検出部８１から供給される電池電圧情報から、検出電圧Vbattが所定の閾値Vthより大きいか否かを判別する。CPU４１は、それらの判別結果に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１４）を読み出し、ストロボ充電制御部７１に供給する。

【００８５】ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボコンデンサの充電時間を変更するように制御する。

【００８６】ところで、一般的な電池の特性として、電池電圧が低下した場合には、内部インピーダンスが増加するなどによって電池特性が悪化する。すなわち、撮像装置１において、電池電圧が低下した場合に、ストロボ充電時間を短くしようとすると電池の寿命が悪化する。

【００８７】そこで、図１３に示した撮像装置１では、電池検出スイッチ１５から供給される検出信号がオン信号（ボックス型電池３１の使用時）で電池電圧検出部８１から供給される検出電圧が所定の閾値以上の場合、最も短い充電時間でストロボ機構７２のストロボコンデンサが充電され、検出信号がオン信号で検出電圧が所定の閾値より小さい場合、通常よりは短い充電時間でストロボ機構７２が充電され、検出信号がオフ信号（単３型電池２１－１，２１－２の使用時）で検出電圧が所定の閾値以上の場合、通常の充電時間でストロボ機構７２が充電され、検出信号がオフ信号で検出電圧が所定の閾値より小さい場合、通常より長い充電時間でストロボ機構７２が充電されるようにする。

【００８８】次に、図１５のフローチャートを参照して、図１３の撮像装置１が実行するストロボ充電時間制御処理について説明する。この処理を開始するにあたり、撮像装置１には、バッテリ２が装着されているものとし、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から検出信号が供給されており、電池電圧検出部８１から検出電圧が供給されているものとする。

【００８９】ステップＳ３１において、撮像装置１のCPU４１は、電池検出スイッチ１５から供給されてきた検出信号がオン信号であるか、またはオフ信号であるか否かを判別する。ステップＳ３２において、CPU４１は、電池電圧検出部８１から供給されてきた電池電圧情報から、検出電圧Vbattが所定の閾値Vthより大きいか否かを判別する。

【００９０】ステップＳ３３において、CPU４１は、ステップＳ３１およびＳ３２の処理による判別結果に基づいて、すなわち、検出信号および電池電圧情報に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１４）を読み出し、ストロボ充電制御部７１に

供給する。

【００９１】例えば、検出信号がオフ信号（単３型電池２１－１，２１－２の使用時）で検出電圧が所定の閾値以上であった場合、「D1」のストロボ充電時間設定値（秒）が読み出され、検出信号がオフ信号で検出電圧が所定の閾値より小さい場合、「D2」のストロボ充電時間設定値（秒）が読み出され、検出信号がオン信号（ボックス型電池３１の使用時）で検出電圧が所定の閾値以上であった場合、「D3」のストロボ充電時間設定値（秒）が読み出され、検出信号がオン信号で検出電圧が所定の閾値より小さい場合、「D4」のストロボ充電時間設定値（秒）が読み出される。

【００９２】ステップＳ３４において、ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボ充電時間を制御する。

【００９３】例えば、CPU４１から「D1」のストロボ充電時間設定値（秒）が供給された場合、「D1（秒）」の充電時間でストロボ機構７２のストロボコンデンサが充電される。また例えば、CPU４１から「D2」、「D3」、または「D4」のストロボ充電時間設定値（秒）がそれぞれ供給された場合、「D2（秒）」、「D3（秒）」、または「D4（秒）」の充電時間で、それぞれ、ストロボ機構７２のストロボコンデンサが充電される。なお、消費電力の関係は、D2<D1<D4<D3となる。

【００９４】このように、撮像装置１は、バッテリ２のバッテリボックス１１に収納されている電池の種類および電池電圧に基づいて、最適な充電時間で、ストロボ機構７２のストロボコンデンサを充電することが可能になる。

【００９５】またバッテリ２のバッテリボックス１１に収納されている電池の種類および電池電圧に応じて、最適な充電時間で、ストロボ機構７２のストロボコンデンサを充電するだけでなく、例えば、ズーム機構４５（図４）を最適なズームスピードでズームしたり、あるいは、表示画面６２（図１０）を最適な明度で表示することもできる。

【００９６】図１６は、図１に示した撮像装置１とバッテリ２の他の内部の構成例を示す図である。なお、図１３と対応する部分には、同一の符号を付してあり、その説明は適宜省略する。図１６の例の場合、バッテリ２に、温度検出部９１が新たに設けられている以外は、図１３と同様の構成とされる。

【００９７】温度検出部９１は、バッテリボックス１１に収納されている電池の周囲温度を検出し、温度情報（検出温度）を撮像装置１に供給する。

【００９８】メモリ４２には、電池種別、電池電圧情報、および温度情報に応じたストロボ機構７２のストロボ充電時間設定値のテーブルが予め格納されている。

【００９９】ここで図１７を参照して、メモリ４２に記録されているストロボ充電時間設定値のテーブルの例について説明する。同図に示されるように、電池検出スイッチ１５から供給される検出信号、電池電圧検出部８１から供給される電池電圧情報（検出電圧）、および温度検出部９１から供給される温度情報（検出温度）に対応付けて、ストロボ充電時間設定値が格納されている。なお、Vbattは検出電圧を表わし、Vthは所定の閾値の電圧を表わしている。またＴは検出温度を表わし、Tthは、所定の閾値の温度を表わしている。

【０１００】図１７の例においては、「OFF」の検出信号、「Vbatt≧Vth」の検出電圧、および「Ｔ≧Tth」の検出温度に対応して、「E1」のストロボ充電時間設定値（秒）が記録され、「OFF」の検出信号、「Vbatt≧Vth」の検出電圧、および「Ｔ＜Tth」の検出温度に対応して、「E2」のストロボ充電時間設定値（秒）が記録され、「OFF」の検出信号、「Vbatt＜Vth」の検出電圧、および「Ｔ≧Tth」の検出温度に対応して、「E3」のストロボ充電時間設定値（秒）が記録され、「OFF」の検出信号、「Vbatt＜Vth」の検出電圧、および「Ｔ＜Tth」の検出温度に対応して、「E4」のストロボ充電時間設定値（秒）が記録されている。

【０１０１】また、「ON」の検出信号、「Vbatt≧Vth」の検出電圧、および「Ｔ≧Tth」の検出温度に対応して、「E5」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号、「Vbatt≧Vth」の検出電圧、および「Ｔ＜Tth」の検出温度に対応して、「E6」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号、「Vbatt＜Vth」の検出電圧、および「Ｔ≧Tth」の検出温度に対応して、「E7」のストロボ充電時間設定値（秒）が記録され、「ON」の検出信号、「Vbatt＜Vth」の検出電圧、および「Ｔ＜Tth」の検出温度に対応して、「E8」のストロボ充電時間設定値（秒）が記録されている。

【０１０２】図１６の説明に戻る。CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、バッテリボックス１１に収納されている電池の種類を判別し、電池電圧検出部８１から供給される電池電圧情報から、検出電圧Vbattが所定の閾値Vthより大きいか否かを判別し、さらに温度検出部９１から供給される温度情報から、検出温度Ｔが所定の閾値Tthより大きいか否かを判別する。CPU４１は、それらの判別結果に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１７）を読み出し、ストロボ充電制御部７１に供給する。

【０１０３】ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボコンデンサの充電時間を変更するように制御する。

【０１０４】ところで、一般的な電池の特性として、周

囲温度が低下した場合には、内部インピーダンスが増加するなどによって電池特性が悪化する。すなわち、撮像装置１において、周囲温度が低下した場合に、ストロボ充電時間を短くしようとすると電池の寿命が悪化する。

【０１０５】そこで、図１６に示した撮像装置１では、電池検出スイッチ１５から供給される検出信号がオン信号（ボックス型電池３１の使用時）、電池電圧検出部８１から供給される検出電圧が所定の閾値以上、および温度検出部９１から供給される検出温度が所定の閾値以上の場合、最も短い充電時間でストロボ機構７２が充電され、検出信号がオフ信号（単３型電池２１－１，２１－２の使用時）、検出電圧が所定の閾値より小さく、および検出温度が所定の閾値より低い場合、最も長い充電時間でストロボ機構７２が充電され、同様に、検出信号、検出電圧、および検出温度に応じて、最適な充電時間でストロボ機構７２が充電されるようにする。

【０１０６】次に、図１８のフローチャートを参照して、図１６の撮像装置１が実行するストロボ充電時間制御処理について説明する。この処理を開始するにあたり、撮像装置１には、バッテリ２が装着されているものとし、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から検出信号が供給されており、電池電圧検出部８１から検出電圧が供給されており、さらに温度検出部９１から検出温度が供給されているものとする。

【０１０７】ステップＳ４１において、撮像装置１のCPU４１は、電池検出スイッチ１５から供給されてきた検出信号がオン信号であるか、またはオフ信号であるか否かを判別する。ステップＳ４２において、CPU４１は、電池電圧検出部８１から供給されてきた電池電圧情報から、検出電圧Vbattが所定の閾値Vthより大きいか否かを判別する。ステップＳ４３において、CPU４１は、温度検出部９１から供給されてきた温度情報から、検出温度Ｔが所定の閾値Tthより大きいか否かを判別する。

【０１０８】ステップＳ４４において、CPU４１は、ステップＳ４１乃至Ｓ４３の処理による判別結果に基づいて、すなわち、検出信号、電池電圧情報、および温度情報に基づいて、メモリ４２を参照し、対応するストロボ充電時間設定値（図１７）を読み出し、ストボロ充電制御部７１に供給する。

【０１０９】例えば、検出信号がオフ信号（単３型電池２１－１，２１－２の使用時）、並びに検出電圧および検出温度が所定の閾値以上であった場合、「E1」のストロボ充電時間設定値（秒）が読み出され、検出信号がオフ信号、検出電圧が所定の閾値以上、および検出温度が所定の閾値より低い場合、「E2」のストロボ充電時間設定値（秒）が読み出され、検出信号がオフ信号、検出電圧が所定の閾値より小さく、および検出温度が所定の閾値以上であった場合、「E3」のストロボ充電時間設定値（秒）が読み出され、検出信号がオフ信号、並びに検出電圧および検出温度が所定の閾値より小さいまたは低い場合、「E4」のストロボ充電時間設定値（秒）が読み出される。

【０１１０】また例えば、検出信号がオン信号（ボックス型電池３１の使用時）、並びに検出電圧および検出温度が所定の閾値以上であった場合、「E5」のストロボ充電時間設定値（秒）が読み出され、検出信号がオン信号、検出電圧が所定の閾値以上、および検出温度が所定の閾値より低い場合、「E6」のストロボ充電時間設定値（秒）が読み出され、検出信号がオン信号、検出電圧が所定の閾値より小さく、および検出温度が所定の閾値以上であった場合、「E7」のストロボ充電時間設定値（秒）が読み出され、検出信号がオフ信号、並びに検出電圧および検出温度が所定の閾値より小さいまたは低い場合、「E8」のストロボ充電時間設定値（秒）が読み出される。

【０１１１】ステップＳ４５において、ストロボ充電制御部７１は、CPU４１から供給されたストロボ充電時間設定値に基づいて、ストロボ機構７２のストロボ充電時間を制御する。

【０１１２】例えば、CPU４１から「E1」のストロボ充電時間設定値（秒）が供給された場合、「E1（秒）」の充電時間でストロボ機構７２のストロボコンデンサが充電される。また例えば、CPU４１から「E2」、「E3」、「E4」、「E5」、「E6」、「E7」、または「E8」のストロボ充電時間設定値（秒）がそれぞれ供給された場合、「E2（秒）」、「E3」、「E4」、「E5」、「E6」、「E7」、または「E8」の充電時間で、それぞれ、ストロボ機構７２のストロボコンデンサが充電される。なお、消費電力の関係は、E4＜＜E3＜E2＜E1＜E8＜E7＜E6＜E5となる。

【０１１３】このように、撮像装置１は、バッテリ２のバッテリパック１１に収納されている電池の種類、電池電圧、および電池の周囲温度に基づいて、より最適な充電時間で、ストロボ機構７２のストロボコンデンサを充電することが可能になる。

【０１１４】またバッテリ２のバッテリボックス１１に収納されている電池の種類、電池電圧、および電池の周囲温度に応じて、より最適な充電時間で、ストロボ機構７２のストロボコンデンサを充電するだけでなく、例えば、ズーム機構４５（図４）をより最適なズームスピードでズームしたり、あるいは、表示画面６２（図１０）をより最適な明度で表示することもできる。

【０１１５】以上においては、電池種別に応じてズーム機構４５のズームスピードを制御する場合の構成例を図４に示し、電池種別に応じて表示画面６２の明度を制御する場合の構成例を図７に示し、電池種別に応じてストロボ機構７２のストロボ充電時間を制御する場合の構成例を図１０に示した。さらに、電池種別および電池電圧に応じてストロボ機構７２のストロボ充電時間を制御する場合の構成例を図１３に示し、電池種別、電池電圧、

および電池の周囲温度に応じてストロボ機構７２のストロボ充電時間を制御する場合の構成例を図１６に示した。これらは、説明をわかり易くするために個々に図示したものであり、当然、任意の組み合わせで、ズームスピード、画面の明度、およびストロボ充電時間を制御することができる。

【０１１６】その場合の構成例を図１９に示す。メモリ４２には、図５に示した電池種別に応じたズームスピード設定値のテーブル、図８に示した電池種別に応じた明度設定値のテーブル、図１１に示した電池種別に応じたストロボ充電時間設定値のテーブル、図１４に示した電池種別および電池電圧情報に応じたストロボ充電時間設定値のテーブル、および図１７に示した電池種別、電池電圧情報、および温度情報に応じたストロボ充電時間設定値のテーブルなどが予め格納されている。

【０１１７】CPU４１は、バッテリ２の電池種別判定機構１２の電池検出スイッチ１５から供給されるオンまたはオフの検出信号から、バッテリボックス１１に収納されている電池の種類を判別し、電池電圧検出部８１から供給される電池電圧情報から、検出電圧Vbattが所定の閾値Vthより大きいか否かを判別し、さらに温度検出部９１から供給される温度情報から、検出温度Ｔが所定の閾値Tthより大きいか否かを判別する。

【０１１８】CPU４１は、それらの判別結果に基づいて、メモリ４２を参照し、対応するズームスピード設定値（図５）を読み出してズーム制御部４３に供給し、ズーム機構４５のズームスピードを制御させるようにしたり、明度設定値（図８）を読み出して画面明度制御部６１に供給し、表示画面６２の明度を制御させるようにしたり、ストロボ充電時間設定値（図１７）を読み出してストロボ充電制御部７１に供給し、ストロボ機構７２のストロボ充電時間を制御させるようにする。

【０１１９】またCPU４１は、ズーム機構４５のズームスピード、表示画面６２の明度、およびストロボ機構７２のストロボ充電時間のうち、いずれか１つの動作条件のみを制御するようにしたり、いずれか２つの動作条件を制御するようにしたり、あるいは、３つの動作条件全てを制御することができる。その場合、電池種別、電池電圧情報、および温度情報のうち、いずれか１つのパラメータに応じて制御するか、いずれか２つのパラメータに応じて制御するか、あるいは、３つのパラメータ全てに応じて制御するかを自由に切り替えることも可能である。

【０１２０】従って、本発明の撮像装置１では、バッテリ2のバッテリボックス１１に収納された電池の種類、電池電圧の残り具合、または電池の周囲温度の組み合わせに応じて、ズーム機構４５のズームスピード、表示画面６２の明度、またはストロボ機構７２のストロボ充電時間のうち、いずれか１つ、いずれか２つ、あるいは、３つ全ての動作条件を自由に制御することができ、電池の特性を充分に引き出すことが可能になる。

【０１２１】その場合、ユーザが、図示せぬ入力部を操作して、制御したい動作条件を自由に切り替えられるようにしてもよい。

【０１２２】以上においては、本発明を撮像装置１に適用した例について説明したが、これに限らず、バッテリ２により駆動可能な他の電子機器に広く適用することが可能である。

【０１２３】また以上においては、バッテリボックス１１に単３型電池２１－１，２１－２が収納されているか、あるいは、ボックス型電池３１が収納されているかを電池検出スイッチ１５により識別するようにしたが、これに限らず、３種類以上の電池を識別できるような機構を設け、各種電池の特性を最大限に引き出すことができるように、各動作条件を制御することもできる。

【０１２４】上述した一連の処理は、ハードウェアにより実行させることもできるが、ソフトウェアにより実行させることもできる。一連の処理をソフトウェアにより実行させる場合には、そのソフトウェアを構成するプログラムが、専用のハードウェアに組み込まれているコンピュータ、または、各種のプログラムをインストールすることで、各種の機能を実行することが可能な、例えば汎用のパーソナルコンピュータなどに、記録媒体からインストールされる。

【０１２５】コンピュータにインストールされ、コンピュータによって実行可能な状態とされるプログラムを記録する記録媒体は、図４に示されるように、磁気ディスク５１（フレキシブルディスクを含む）、光ディスク５２（CD-ROM、DVD(Digital Versatile Disc)を含む）、光磁気ディスク５３（MD(Mini-Disc)（登録商標）を含む）、もしくは半導体メモリ５４などよりなるパッケージメディア、または、プログラムが一時的もしくは永続的に記録されるFlash ROMやハードディスクドライブなどにより構成される。記録媒体へのプログラムの記録は、必要に応じてルータ、モデムなどのインターフェースを介して、公衆回線網、ローカルエリアネットワーク、またはインターネットなどのネットワーク、デジタル衛星放送といった、有線または無線の通信媒体を利用して行われる。

【０１２６】なお、本明細書において、記録媒体に記録されるプログラムを記述するステップは、記載された順序に沿って時系列的に行われる処理はもちろん、必ずしも時系列的に処理されなくとも、並列的あるいは個別に実行される処理をも含むものである。

【０１２７】

【発明の効果】以上のように、本発明によれば、電子装置に装着されたバッテリの種類を識別することができる。

【０１２８】また本発明によれば、電子装置に装着されたバッテリの種類を識別し、その種類により電子装置の

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動作条件を変更することが可能になる。

【図面の簡単な説明】

【図１】本発明を適用した撮像装置とバッテリの接続例を示す図である。

【図２】バッテリの構成例を示す図である。

【図３】バッテリの他の構成例を示す図である。

【図４】撮像装置とバッテリの内部の構成例を示す図である。

【図５】図４のメモリに記録されているズームスピード設定値のテーブルの例を示す図である。

【図６】図４の撮像装置が実行するズームスピード制御処理を説明するフローチャートである。

【図７】撮像装置とバッテリの内部の他の構成例を示す図である。

【図８】図７のメモリに記録されている明度設定値のテーブルの例を示す図である。

【図９】図７の撮像装置が実行する画面明度制御処理を説明するフローチャートである。

【図１０】撮像装置とバッテリの内部の他の構成例を示す図である。

【図１１】図１０のメモリに記録されているストロボ充電時間設定値のテーブルの例を示す図である。

【図１２】図１０の撮像装置が実行するストロボ充電時間制御処理を説明するフローチャートである。

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【図１３】撮像装置とバッテリの内部の他の構成例を示す図である。

【図１４】図１３のメモリ４２に記録されているストロボ充電時間設定値のテーブルの例を示す図である。

【図１５】図１３の撮像装置が実行するストロボ充電時間制御処理を説明するフローチャートである。

【図１６】撮像装置とバッテリの内部の他の構成例を示す図である。

【図１７】図１６のメモリ４２に記録されているストロボ充電時間設定値のテーブルの例を示す図である。

【図１８】図１６の撮像装置１が実行するストロボ充電時間制御処理を説明するフローチャートである。

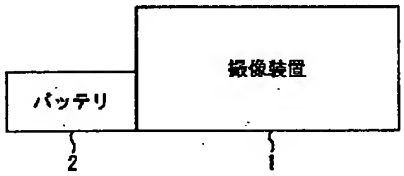
【図１９】撮像装置とバッテリの内部の他の構成例を示す図である。

【符号の説明】

１　撮像装置，　２　バッテリ，　１１　バッテリボックス，　１２　電池種別判定機構，　１３　可動しきい，　１４　ばね，　１５　電池検出スイッチ，２１－１，２１－２　単３型電池，　３１　ボックス型電池，　４１　CPU，４２　メモリ，　４３　ズーム制御部，　４５　ズーム機構，　６１　画面明度制御部，　６２　表示画面，　７１　ストロボ充電制御部，　７２　ストロボ機構，　８１　電池電圧検出部，　９１　温度検出部

【図１】

図1



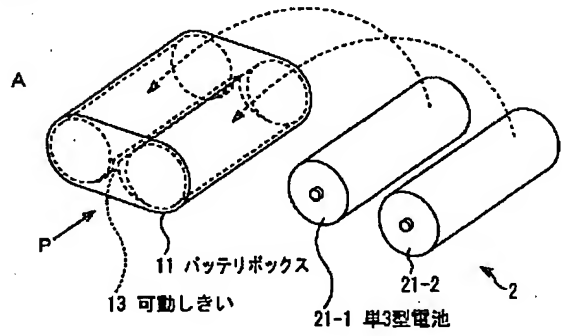
【図５】

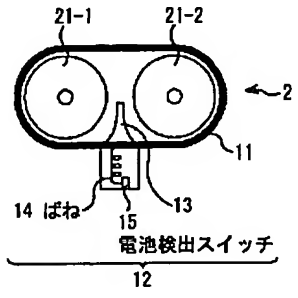
図5

検出信号	ズームスピード設定値(秒)
OFF	A1(遅い)
ON	A2(速い)

【図２】

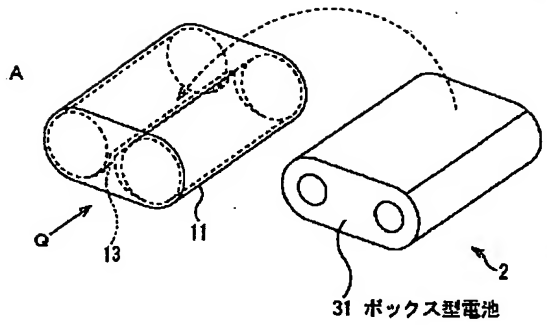
図2

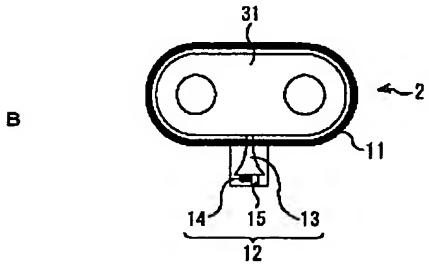




【図３】

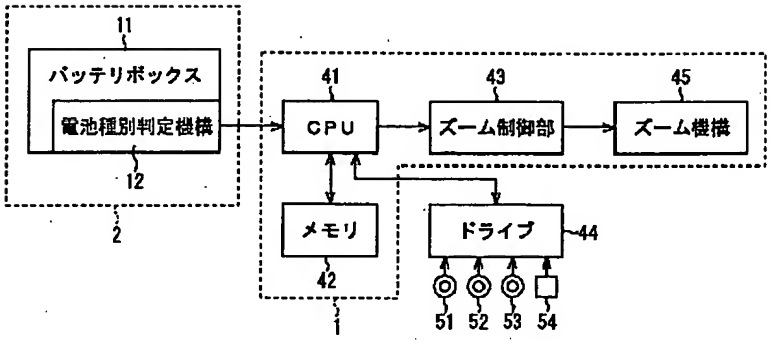
図3





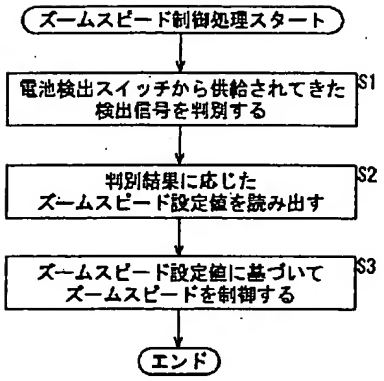
【図４】

図4



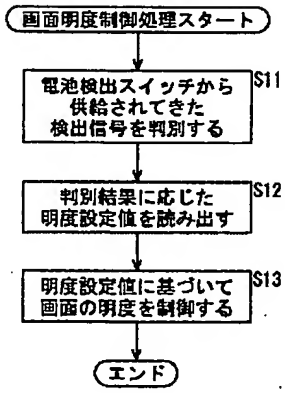
【図６】

図6



【図９】

図9



【図８】

図8

検出信号	明度設定値 (cd/m^2)
OFF	B1(暗い)
ON	B2(明るい)

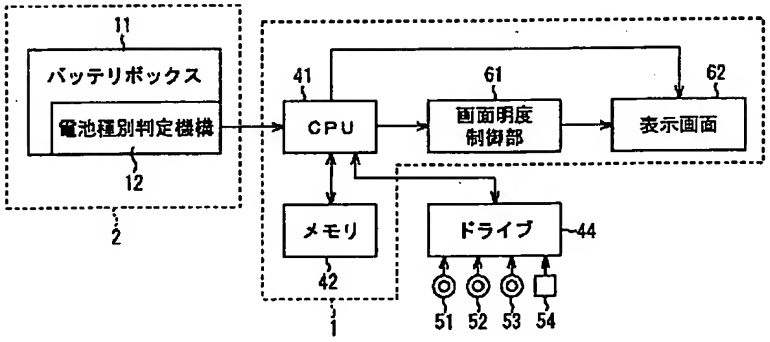
【図１１】

図11

検出信号	ストロボ充電時間設定値(秒)
OFF	C1(遅い)
ON	C2(速い)

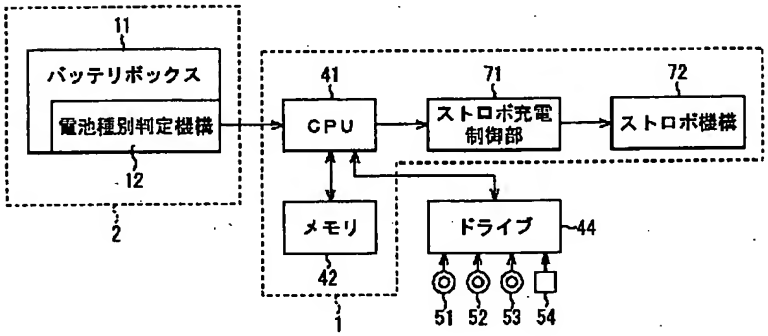
【図７】

図7



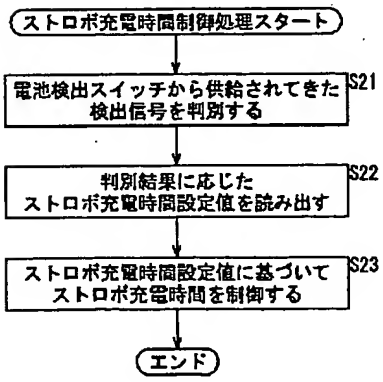
【図１０】

図10



【図１２】

図12



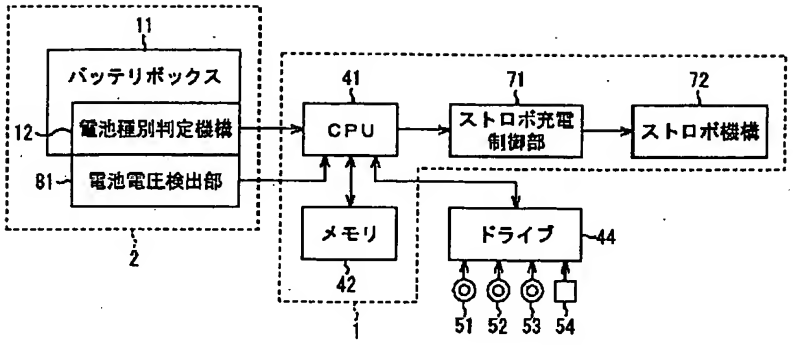
【図１４】

図14

検出信号	検出電圧Vbatt	ストロボ充電時間設定値(秒)
OFF	Vbatt≧Vth	D1
OFF	Vbatt<Vth	D2
ON	Vbatt≧Vth	D3
ON	Vbatt<Vth	D4

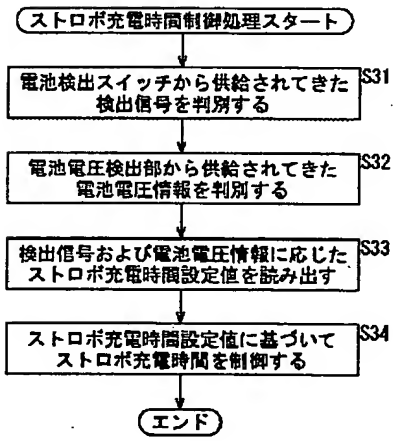
【図１３】

図13



【図１５】

図15



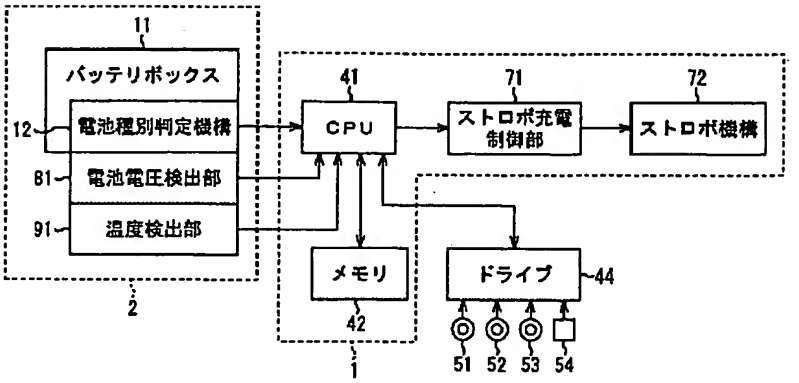
【図１７】

図17

検出信号	検出電圧Vbatt	検出温度T	ストロボ充電時間設定値(秒)
OFF	Vbatt≧Vth	T≧Tth	E1
OFF	Vbatt≧Vth	T<Tth	E2
OFF	Vbatt<Vth	T≧Tth	E3
OFF	Vbatt<Vth	T<Tth	E4
ON	Vbatt≧Vth	T≧Tth	E5
ON	Vbatt≧Vth	T<Tth	E6
ON	Vbatt<Vth	T≧Tth	E7
ON	Vbatt<Vth	T<Tth	E8

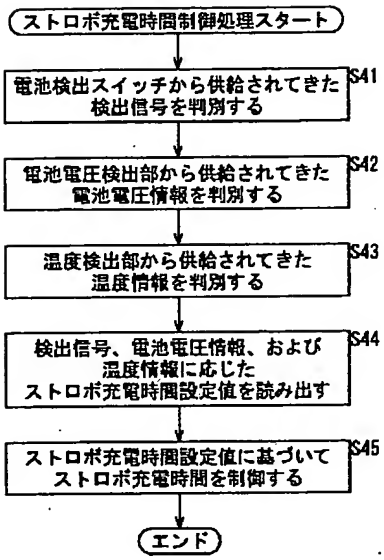
【図１６】

図16



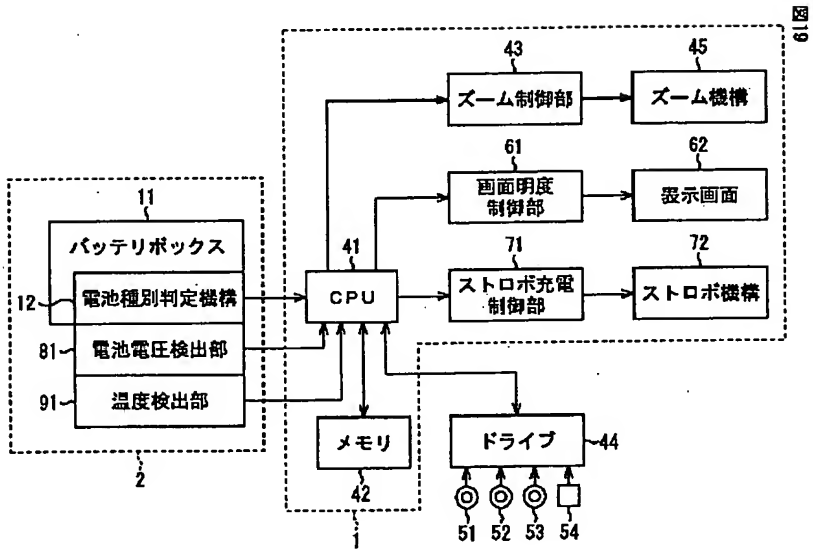
【図１８】

図18



【図１９】

図19



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(51)Int.Cl.'	識別記号	FI	テーマコード'(参考)
H04N 5/225		G06F 1/00	332Z

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] The electronic instrument characterized by to have an acquisition means supplied from said power supply acquire a signal which identifies classification of a cell, a judgment means judge classification of said cell based on said signal acquired by said acquisition means, and the control means which control predetermined actuation of said electronic instrument based on a judgment result by said judgment means in the electronic instrument which drives with power supply.
[Claim 2] Said control means is an electronic instrument according to claim 1 characterized by controlling to change at least one of zoom speed of said electronic instrument, lightness of a screen of said electronic instrument, or the stroboscope charging times of said electronic instrument.
[Claim 3] It is the electronic instrument according to claim 1 which is further equipped with a voltage detection means supplied from said power supply to detect voltage of said cell, and is characterized by said control means controlling predetermined actuation of said electronic instrument based on a judgment result by said judgment means, and a voltage detection result by said voltage detection means.
[Claim 4] It is the electronic instrument according to claim 1 which is further equipped with a temperature detection means supplied from said power supply to detect ambient temperature of said cell, and is characterized by said control means controlling predetermined actuation of said electronic instrument based on a judgment result by said judgment means, and a temperature detection result by said temperature detection means.
[Claim 5] A voltage detection means supplied from said power supply to detect voltage of said cell, It has further a temperature detection means supplied from said power supply to detect ambient temperature of said cell. Said control means An electronic instrument according to claim 1 characterized by controlling predetermined actuation of said electronic instrument based on a judgment result by said judgment means, a voltage detection result by said voltage detection means, and a temperature detection result by said temperature detection means.
[Claim 6] the electronic instrument according to claim 1 characterized by to have further a storage means memorize condition information for controlling said predetermined actuation, and for said control means to carry out the reading appearance of said condition information memorized by said storage means based on a judgment result by said judgment means, and to control predetermined actuation of said electronic instrument based on said condition information which carried out reading appearance.
[Claim 7] A control method of an electronic instrument driven with power supply characterized by providing the following An acquisition control step which controls acquisition of a signal which identifies classification of a cell supplied from said power supply A judgment step which judges classification of said cell based on said signal with which acquisition was controlled by processing of said acquisition control step A control step which controls predetermined actuation of said electronic instrument based on a judgment result by processing of said judgment step
[Claim 8] A program which controls an electronic instrument which is characterized by providing the following, and which is driven with power supply An acquisition control step which controls acquisition of a signal which identifies classification of a cell supplied from said power supply A judgment step which judges classification of said cell based on said signal with which acquisition was controlled by processing of said acquisition control step A control step which controls

predetermined actuation of said electronic instrument based on a judgment result by processing of said judgment step

[Claim 9] Perform the acquisition control step which controls the acquisition of the signal which identifies the classification of a cell supplied from said power supply to the computer which controls the electronic instrument which drives with power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of said acquisition control step, and the control step control predetermined actuation of said electronic instrument based on the judgment result by processing of said judgment step.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] Especially this invention relates to a program at the electronic instrument which controlled predetermined actuation and the control method, a record medium, and a list according to the class of battery with which an electronic instrument is equipped about a program at an electronic instrument and the control method, a record medium, and a list.
[0002]
[Description of the Prior Art] the former and two AA -- it is possible to use the cell of various classes in the battery drive mold electronic instrument which makes a mold cell a power source.
[0003] AA -- in the case of a mold cell, two alkaline cells, two nickel primary cells, or two nickel rechargeable batteries can be used. Moreover, in the case of a box mold cell, for example, a lithium primary cell or a lithium secondary battery can be used.
[0004]
[Problem(s) to be Solved by the Invention] However, there is a big difference in the power capacity and the property of these cells. for example, two alkali -- AA -- a big difference is in power capacity, the impedance in the time of low temperature, and the impedance characteristic at the time of cell voltage reduction with a mold cell and a lithium primary cell.
[0005] That is, although the difference of the property of a cell is large, with the current battery drive mold electronic instrument, it is operating on the conditions same related always as the class of battery. Therefore, like a lithium primary cell, even if it was the battery of high capacity and low impedance, the technical problem which cannot pull out the merit to the maximum extent occurred.
[0006] This invention is made in view of such a condition, and enables it to change the operating condition of an electronic instrument according to the class of battery.
[0007]
[Means for Solving the Problem] An electronic instrument of this invention is characterized by having an acquisition means supplied from power supply to acquire a signal which identifies classification of a cell, a judgment means to judge classification of a cell based on a signal acquired by acquisition means, and a control means which controls predetermined actuation of an electronic instrument based on a judgment result by judgment means.
[0008] A control means can be made to control to change at least one of zoom speed of an electronic instrument, lightness of a screen of an electronic instrument, or the stroboscope charging times of an electronic instrument.
[0009] A voltage detection means supplied from power supply to detect voltage of a cell can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on a judgment result by judgment means, and a voltage detection result by voltage detection means.
[0010] A temperature detection means supplied from power supply to detect ambient temperature of a cell can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on a judgment result by judgment means, and a temperature detection result by temperature detection means.
[0011] A voltage detection means supplied from power supply detect voltage of a cell, and a temperature detection means supplied from power supply detect ambient temperature of a cell can

establish further, and a control means can make control predetermined actuation of an electronic instrument based on a judgment result by judgment means, a voltage detection result by voltage detection means, and a temperature detection result by temperature detection means.
[0012] A storage means memorize condition information for controlling predetermined actuation can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on condition information to which reading appearance of the condition information memorized by storage means was carried out, and it carried out reading appearance based on a judgment result by judgment means.
[0013] The control method of this invention carries out containing the acquisition control step which controls the acquisition of the signal which identifies the classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step as the feature.
[0014] The program currently recorded on the record medium of this invention carries out containing the acquisition control step which controls the acquisition of the signal which identifies the classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step as the feature.
[0015] The program of this invention makes a computer perform the acquisition control step which controls the acquisition of the signal which identifies classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step.
[0016] A signal which identifies classification of a cell supplied to an electronic instrument of this invention and a control method, and a list from power supply in a program is acquired, based on an acquired signal, classification of a cell is judged and predetermined actuation of an electronic instrument is controlled based on the judgment result.
[0017]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to drawing.
[0018] Drawing 1 is drawing showing the example of connection of image pick-up equipment 1 and a battery 2 which applied this invention.
[0019] It is the image pick-up device which consists of a still camera, a digital camera, or a camcorder, and image pick-up equipment 1 changes the zoom speed of the zoom device 45 (drawing 4), the lightness of the display screen 62 (drawing 7), or the stroboscope charging time of the stroboscope device 72 (drawing 10) according to the classification of the cell of the battery 2 with which it is equipped.
[0020] As shown in this drawing, the applied part which image pick-up equipment 1 does not illustrate is equipped with the battery 2, and it supplies power to image pick-up equipment 1.
[0021] Drawing 2 is drawing showing the example of a configuration of a battery 2. Drawing 2 A shows the appearance perspective diagram of a battery 2, and drawing 2 B shows the side cross section seen from [of drawing 2 A] arrow head P.
[0022] The battery 2 consists of cell classification judging devices 12 for distinguishing the battery box (cell receipt device) 11 for containing a cell 21-1 and 21-2, and the class of cell. The cell classification judging device 12 consists of a movable threshold 13, a spring 14, and a cell pilot switch 15 further.
[0023] The movable threshold 13 is supported with the spring 14, and is made by down possible movable among drawing 2 B. The cell pilot switch 15 is connected to the movable threshold 13 through the spring 14. Usually, a spring 14 will expand and contract, and although the cell pilot switch 15 is in an off condition, if movable [of the movable threshold 13] is carried out to down, the force (energization force) which is going to press the cell pilot switch 15 will work. Thus, as for

the cell pilot switch 15, it switches on using the energization force of a spring 14. The cell pilot switch 15 supplies ON/OFF (ON/OFF) signal of a switch to image pick-up equipment 1.
[0024] AA -- the mold cell 21-1 and 21-2 consist of an alkaline cell, a nickel primary cell, or a nickel rechargeable battery, and as shown in the dotted line arrow head of drawing 2 A, they are contained by the battery box 11. in this case, AA -- since the mold cell 21-1 and 21-2 are contained by the battery box 11 on both sides of the movable threshold 13, movable [of the movable threshold 13] is not carried out to down [in drawing 2 B] namely, AA -- when the mold cell 21-1 and 21-2 are contained by the battery box 11, the cell pilot switch 15 is still an off condition.
[0025] Drawing 3 is drawing showing other examples of a configuration of a battery 2. Drawing 3 A shows the appearance perspective diagram of a battery 2, and drawing 3 B shows the side cross section seen from [of drawing 3 A] arrow head Q. In addition, the same sign is given to drawing 2 and a corresponding portion, and the explanation is omitted suitably.
[0026] the box mold cell 31 -- AA -- it consists of a lithium primary cell which has the width of face of two duties of a mold cell, or a lithium secondary battery, and it is contained by the battery box 11 as shown in the dotted line arrow head of drawing 3 A. In this case, movable [of the movable threshold 13] is carried out to down [in drawing 3 B] by the box mold cell 31 being contained by the battery box 11. That is, when the box mold cell 31 is contained by the battery box 11, the cell pilot switch 15 changes in the condition of ON.
[0027] Drawing 4 is drawing showing the example of a configuration inside image pick-up equipment 1 and a battery 2 shown in drawing 1 .
[0028] CPU41 distinguishes the class of cell with which it is equipped from the ON or the off detecting signal supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2. CPU41 reads the corresponding zoom speed set point (drawing 5) with reference to memory 42 based on a distinction result, and supplies it to the zoom control section 43.
[0029] The table of the zoom speed set point of the zoom device 45 according to cell classification is beforehand stored in memory 42. Moreover, memory 42 may store the data of immobilization fundamentally of the parameters the program which CPU41 uses, and for an operation, or you may make it store a variable parameter etc. suitably in program execution.
[0030] With reference to drawing 5 , the example of the table of the zoom speed set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the zoom speed set point is stored.
[0031] In the example of drawing 5 , corresponding to the detecting signal of "OFF", the zoom speed set point (second) of "A1 (late)" is recorded, and the zoom speed set point (second) of "A2 (quick)" is recorded corresponding to the detecting signal of "ON."
[0032] In addition, you may make it make the value which changed the time amount of "A1" and "A2" by the predetermined calculation method store in memory 42.
[0033] It returns to explanation of drawing 4 . The zoom control section 43 is controlled based on the zoom speed set point supplied from CPU41 to change the zoom speed of the zoom device 45.
[0034] Drive 44 is connected to CPU41 again if needed, and drive 44 is equipped with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54 if needed. Drive 44 reads the data or the program currently recorded on a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and supplies the data or program to CPU41 or memory 42.
[0035] Although hereafter explained to memory 42 as that in which the table of the zoom speed set point according to cell classification is stored beforehand Drive 44 is connected not only to this but to CPU41. To drive 44 It is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, reading appearance of the table of the zoom speed set point currently recorded on them is carried out, and you may make it make it store in memory 42.
[0036] By the way, in image pick-up equipment 1, in order to make the zoom device 45 drive at a quicker zoom speed, larger power is needed for a short time. That is, when the cell engine performance is inferior, if you are going to make it drive at a quick zoom speed, the life of a cell will get worse.
[0037] the AA which showed the box mold cell 31 shown in drawing 3 to drawing 2 -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- even if it

makes the zoom device 45 drive at a quicker zoom speed, there is less effect which it has on the life of a cell than the time of mold cell use.

[0038] Then, when the detecting signal supplied from the cell pilot switch 15 with the image pick-up equipment 1 shown in drawing 4 is an ON signal (at the time of use of the box mold cell 31), The zoom device 45 drives at a quicker zoom speed, and when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), it is made for the zoom device 45 to drive at the usual speed (or speed later than the zoom speed at the time of use of the box mold cell 31).

[0039] Next, with reference to the flow chart of drawing 6 , the zoom speed control processing which the image pick-up equipment 1 of drawing 4 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.

[0040] In step S1, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S2, CPU41 reads the corresponding zoom speed set point (drawing 5) with reference to memory 42 based on the distinction result by processing of step S1, and supplies it to the zoom control section 43.

[0041] For example, when a detecting signal is an off signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the zoom speed set point (second) of "A1 (late)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the zoom speed set point (second) of "A2 (quick)" is carried out.

[0042] In step S3, the zoom control section 43 controls the zoom speed of the zoom device 45 based on the zoom speed set point supplied from CPU41.

[0043] For example, when the zoom speed set point (second) of "A1 (late)" is supplied from CPU41, the zoom device 45 drives at the zoom speed of "A1 (second)." When the zoom speed set point (second) of "A2 [moreover,] (quick)" is supplied from CPU41, the zoom device 45 drives at the zoom speed of "A2 (second)." In addition, the relation of power consumption is set to A1<A2.

[0044] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to make the zoom device 45 drive at a zoom speed quicker than the time of the mold cell 21-1 and use of 21-2.

[0045] Moreover, it not only controls image pick-up equipment 1, but according to the class of cell contained by the battery box 11 of a battery 2, lightness, the stroboscope charging time, etc. of the display screen can control it to change other operating conditions to change the zoom speed of the zoom device 45. It will explain in order about the example of a configuration in the case of controlling hereafter to change other operating conditions, and its actuation.

[0046] Drawing 7 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 4 and a corresponding portion, and the explanation is omitted suitably.

[0047] The table of the lightness set point of the display screen 62 according to cell classification is beforehand stored in memory 42. Of course, drive 44 is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and reading appearance of the table of the lightness set point currently recorded by them is carried out, and you may make it make it to connect drive 44 to CPU41 and store in memory 42.

[0048] With reference to drawing 8 , the example of the table of the lightness set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the lightness set point is stored.

[0049] In the example of drawing 8 , corresponding to the detecting signal of "OFF", the lightness set point (cd/m2) of "B1 (dark)" is recorded, and the lightness set point (cd/m2) of "B-2 (bright)" is recorded corresponding to the detecting signal of "ON."

[0050] In addition, you may make it make the value which changed the brightness of "B1" and "B-2" by the predetermined calculation method store in memory 42.

[0051] It returns to explanation of drawing 8 . CPU41 distinguishes the class of cell with which it is equipped from the ON or the off detecting signal supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2. CPU41 reads the corresponding lightness set point (drawing 8) with reference to memory 42 based on a distinction result, and supplies it to the screen

lightness control section 61.
[0052] The screen lightness control section 61 is controlled based on the lightness set point supplied from CPU41 to change the lightness of the display screen 62.
[0053] The display screen 62 consists of thin indicating equipments, such as a liquid crystal display, receives data from CPU41 and displays an image or an alphabetic character corresponding to the received data etc.
[0054] By the way, in image pick-up equipment 1, in order to display the display screen 62 more brightly, larger power is needed. That is, when the cell engine performance is inferior, if it is going to display the display screen 62 brightly, the life of a cell will get worse.
[0055] the AA shown in drawing 2 as the box mold cell 31 shown in drawing 3 was mentioned above -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- though the display screen 62 is displayed more brightly, there is less effect which it has on the life of a cell than the time of mold cell use.
[0056] So, when the detecting signal supplied from the cell pilot switch 15 is an ON signal (at the time of use of the box mold cell 31), the display screen 62 is displayed more brightly, and when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), the display screen (or more darkly than the brightness at the time of use of the box mold cell 31) 62 is expressed as the image pick-up equipment 1 shown in drawing 7 with the usual brightness.
[0057] Next, with reference to the flow chart of drawing 9 , the screen lightness control processing which the image pick-up equipment 1 of drawing 7 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.
[0058] In step S11, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S12, CPU41 reads the corresponding lightness set point (drawing 8) with reference to memory 42 based on the distinction result by processing of step S11, and supplies it to the screen lightness control section 61.
[0059] For example, when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the lightness set point (cd/m2) of "B1 (dark)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the lightness set point (cd/m2) of "B-2 (bright)" is carried out.
[0060] In step S13, the screen lightness control section 61 controls the lightness of the display screen 62 based on the lightness set point supplied from CPU41.
[0061] For example, when the lightness set point (cd/m2) of "B1 (dark)" is supplied from CPU41, the display screen 62 is displayed with the brightness of "B1 (cd/m2)." When the lightness set point (cd/m2) of "B-2 [moreover,] (bright)" is supplied from CPU41, the display screen 62 is displayed with the brightness of "B-2 (cd/m2)." In addition, the relation of power consumption serves as B1<B-2.
[0062] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to display the display screen 62 more brightly than the time of the mold cell 21-1 and use of 21-2.
[0063] Drawing 10 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 4 and a corresponding portion, and the explanation is omitted suitably.
[0064] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification is beforehand stored in memory 42. Of course, drive 44 is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and reading appearance of the table of the stroboscope charging-time set point currently recorded by them is carried out, and you may make it make it to connect drive 44 to CPU41 and store in memory 42.
[0065] With reference to drawing 11 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the stroboscope charging-time set point is stored.
[0066] In the example of drawing 11 , corresponding to the detecting signal of "OFF", the

stroboscope charging-time set point (second) of "C1 (late)" is recorded, and the stroboscope charging-time set point (second) of "C2 (quick)" is recorded corresponding to the detecting signal of "ON."

[0067] In addition, you may make it make the value which changed the time amount of "C1" and "C2" by the predetermined calculation method store in memory 42.

[0068] It returns to explanation of drawing 10 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal. CPU41 reads the corresponding stroboscope charging-time set point (drawing 11) with reference to memory 42 based on a distinction result, and supplies it to the stroboscope charge control section 71.

[0069] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor (not shown) of the stroboscope device 72.

[0070] By the way, in image pick-up equipment 1, in order to charge the stroboscope capacitor of the stroboscope device 72 more quickly, larger power is needed for a short time. That is, when the cell engine performance is inferior, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.

[0071] the AA shown in drawing 2 as the box mold cell 31 shown in drawing 3 was mentioned above -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- even if it carries out stroboscope charge by shorter time amount, there is less effect which it has on the life of a cell than the time of mold cell use.

[0072] Then, when the detecting signal supplied from the cell pilot switch 15 with the image pick-up equipment 1 shown in drawing 10 is an ON signal (at the time of use of the box mold cell 31), The stroboscope capacitor of the stroboscope device 72 is charged by the shorter charging time. When a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), the stroboscope capacitor of the stroboscope device 72 is charged by the usual charging time (or time amount longer than the charging time at the time of use of the box mold cell 31).

[0073] Next, with reference to the flow chart of drawing 12 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 10 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.

[0074] In step S21, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S22, CPU41 reads the corresponding stroboscope charging-time set point (drawing 11) with reference to memory 42 based on the distinction result by processing of step S21, and supplies it to the SUTOBORO charge control section 71.

[0075] For example, when a detecting signal is an off signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the stroboscope charging-time set point (second) of "C1 (late)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the stroboscope charging-time set point (second) of "C2 (quick)" is carried out.

[0076] In step S23, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0077] For example, when the stroboscope charging-time set point (second) of "C1 (late)" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "C1 (second)." When the stroboscope charging-time set point (second) of "C [moreover,]2 (quick)" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "C2 (second)." In addition, the relation of power consumption serves as C1<C2.

[0078] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to charge the stroboscope capacitor of the stroboscope device 72 by the charging time shorter than

the time of the mold cell 21-1 and use of 21-2.
[0079] Drawing 13 is drawing showing the example of a configuration inside [other] the battery 2 of the image pick-up equipment 1 shown in drawing 1 . In addition, the same sign is given to drawing 10 and a corresponding portion, and the explanation is omitted suitably. Except that the cell voltage detecting element 81 is newly formed in the battery 2 in the case of the example of drawing 13 , it considers as the same configuration as drawing 10 .
[0080] The cell voltage detecting element 81 detects the voltage of the cell contained by the battery box 11, and supplies cell voltage information (detection voltage) to image pick-up equipment 1.
[0081] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification and cell voltage information is beforehand stored in memory 42.
[0082] With reference to drawing 14 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the cell voltage information (detection voltage) supplied from the detecting signal and the cell voltage detecting element 81 which are supplied from the cell pilot switch 15, and the stroboscope charging-time set point is stored. In addition, Vbatt expresses detection voltage and Vth expresses the voltage of a predetermined threshold.
[0083] In the example of drawing 14 , it corresponds to the detecting signal of "OFF", and the detection voltage of "Vbatt>=Vth." The stroboscope charging-time set point (second) of "D1" is recorded, and it corresponds to the detecting signal of "OFF", and the detection voltage of "Vbatt<Vth." The stroboscope charging-time set point (second) of "D2" is recorded, and it corresponds to the detecting signal of "ON", and the detection voltage of "Vbatt>=Vth." The stroboscope charging-time set point (second) of "D3" is recorded, and the stroboscope charging-time set point (second) of "D4" is recorded corresponding to the detecting signal of "ON", and the detection voltage of "Vbatt<Vth."
[0084] It returns to explanation of drawing 13 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81. CPU41 reads the corresponding stroboscope charging-time set point (drawing 14) with reference to memory 42 based on those distinction results, and supplies it to the stroboscope charge control section 71.
[0085] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor of the stroboscope device 72.
[0086] By the way, as a property of a common cell, when cell voltage falls, a cell property gets worse by internal impedance increasing etc. That is, in image pick-up equipment 1, when cell voltage falls, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.
[0087] Then, when the detection voltage to which the detecting signal supplied from the cell pilot switch 15 is supplied from the cell voltage detecting element 81 in the image pick-up equipment 1 shown in drawing 13 by the ON signal (at the time of use of the box mold cell 31) is beyond a predetermined threshold, The stroboscope capacitor of the stroboscope device 72 is charged by the shortest charging time. When a detecting signal is smaller than a threshold predetermined in detection voltage by the ON signal, the stroboscope device 72 is charged by the charging time shorter than usual. When a detecting signal is beyond a threshold predetermined in detection voltage by the OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), The stroboscope device 72 is charged by the usual charging time, and when a detecting signal is smaller than a threshold predetermined in detection voltage by the off signal, the stroboscope device 72 is charged by the charging time longer than usual.
[0088] Next, with reference to the flow chart of drawing 15 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 13 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, and detection voltage shall be supplied from the cell voltage detecting element 81.
[0089] In step S31, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal

supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S32, CPU41 distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81.
[0090] In step S33, CPU41 reads the corresponding stroboscope charging-time set point (drawing 14) with reference to memory 42 based on a detecting signal and cell voltage information based on the distinction result by processing of steps S31 and S32, and supplies it to the SUTOBORO charge control section 71.
[0091] For example, when a detecting signal is beyond a threshold predetermined in detection voltage by the off signal (at the time [1 AA mold cell 21- 21] of use of -2), When reading appearance of the stroboscope charging-time set point (second) of "D1" is carried out and a detecting signal is smaller than a threshold predetermined in detection voltage by the off signal, When reading appearance of the stroboscope charging-time set point (second) of "D2" was carried out and a detecting signal is beyond a threshold predetermined in detection voltage by the ON signal (at the time of use of the box mold cell 31), Reading appearance of the stroboscope charging-time set point (second) of "D3" is carried out, and when a detecting signal is smaller than a threshold predetermined in detection voltage by the ON signal, reading appearance of the stroboscope charging-time set point (second) of "D4" is carried out.
[0092] In step S34, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0093] For example, when the stroboscope charging-time set point (second) of "D1" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "D1 (second)." When the stroboscope charging-time set point (second) of moreover, "D2", "D3", or "D4" is supplied from CPU41, respectively, the stroboscope capacitor of the stroboscope device 72 is charged, respectively by the charging time of "D2 (second)", "D3 (second)", or "D4 (second)." In addition, the relation of power consumption serves as D2<D1<D4<D3.
[0094] Thus, it becomes possible to be the optimal charging time and to charge the stroboscope capacitor of the stroboscope device 72 based on the class and cell voltage of the cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2.
[0095] Moreover, according to the class and cell voltage of a cell which are contained by the battery box 11 of a battery 2, it can carry out a zoom of the zoom device 45 (drawing 4) at the optimal zoom speed, or it not only charges the stroboscope capacitor of the stroboscope device 72 by the optimal charging time, but can display the display screen 62 (drawing 10) by the optimal lightness.
[0096] Drawing 16 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 13 and a corresponding portion, and the explanation is omitted suitably. Except that the temperature detecting element 91 is newly formed in the battery 2 in the case of the example of drawing 16 , it considers as the same configuration as drawing 13 .
[0097] The temperature detecting element 91 detects the ambient temperature of the cell contained by the battery box 11, and supplies temperature information (detection temperature) to image pick-up equipment 1.
[0098] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification, cell voltage information, and temperature information is beforehand stored in memory 42.
[0099] With reference to drawing 17 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, the cell voltage information (detection voltage) supplied from the cell voltage detecting element 81, and the temperature information (detection temperature) supplied from the temperature detecting element 91, and the stroboscope charging-time set point is stored. In addition, Vbatt expresses detection voltage and Vth expresses the voltage of a predetermined threshold. Moreover, T expresses detection temperature and Tth expresses the temperature of a predetermined threshold.
[0100] In the example of drawing 17 , it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time

set point (second) of "E1" is recorded, and it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T<Tth." The stroboscope charging-time set point (second) of "E2" is recorded, and it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt<Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E3" is recorded, and the stroboscope charging-time set point (second) of "E4" is recorded corresponding to the detecting signal of "OFF", the detection voltage of "Vbatt<Vth", and the detection temperature of "T<Tth."

[0101] Moreover, it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E5" is recorded, and it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T<Tth." The stroboscope charging-time set point (second) of "E6" is recorded, and it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt<Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E7" is recorded, and the stroboscope charging-time set point (second) of "E8" is recorded corresponding to the detecting signal of "ON", the detection voltage of "Vbatt<Vth", and the detection temperature of "T<Tth."

[0102] It returns to explanation of drawing 16 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information which distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth, and is further supplied by the temperature detecting element 91 from the cell-voltage information supplied from the cell voltage detecting element 81. CPU41 reads the corresponding stroboscope charging-time set point (drawing 17) with reference to memory 42 based on those distinction results, and supplies it to the stroboscope charge control section 71.

[0103] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor of the stroboscope device 72.

[0104] By the way, as a property of a common cell, when ambient temperature falls, a cell property gets worse by internal impedance increasing etc. That is, in image pick-up equipment 1, when ambient temperature falls, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.

[0105] With the image pick-up equipment 1 shown in drawing 16 , the detecting signal supplied from the cell pilot switch 15 Then, an ON signal (at the time of use of the box mold cell 31), When it is beyond a threshold predetermined in the detection voltage supplied from the cell voltage detecting element 81, and beyond a threshold predetermined in the detection temperature supplied from the temperature detecting element 91, The stroboscope device 72 is charged by the shortest charging time. A detecting signal An off signal (at the time [1 AA mold cell 21- 21] of use of -2), When [smaller than a threshold predetermined in detection voltage and] lower than a threshold predetermined in detection temperature, the stroboscope device 72 is charged by the longest charging time, and the stroboscope device 72 is similarly charged by the optimal charging time according to a detecting signal, detection voltage, and detection temperature.

[0106] Next, with reference to the flow chart of drawing 18 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 16 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, detection voltage shall be supplied from the cell voltage detecting element 81, and detection temperature shall be further supplied from the temperature detecting element 91.

[0107] In step S41, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S42, CPU41 distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81. In step S43, CPU41 distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information supplied from the temperature detecting element 91.

[0108] In step S44, CPU41 reads the corresponding stroboscope charging-time set point (drawing 17) with reference to memory 42 based on a detecting signal, cell voltage information, and temperature information based on step S41 thru/or the distinction result by processing of S43, and supplies it to the SUTOBORO charge control section 71.
[0109] A detecting signal For example, an off signal (at the time [1 AA mold cell 21- 21] of use of - 2), When detection voltage and detection temperature are beyond predetermined thresholds, reading appearance of the stroboscope charging-time set point (second) of "E1" is carried out to a list. When beyond a threshold predetermined [detecting signal] in off signal and detection voltage and detection temperature are lower than a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E2" is carried out. A detecting signal An off signal, When [smaller than a threshold predetermined in detection voltage and] detection temperature is beyond a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E3" is carried out, and when a detecting signal is smaller than a predetermined threshold in an off signal and a list or detection voltage and its detection temperature are low in them, reading appearance of the stroboscope charging-time set point (second) of "E4" is carried out.
[0110] For example, a detecting signal Moreover, an ON signal (at the time of use of the box mold cell 31), When detection voltage and detection temperature are beyond predetermined thresholds, reading appearance of the stroboscope charging-time set point (second) of "E5" is carried out to a list. When beyond a threshold predetermined [detecting signal] in an ON signal and detection voltage and detection temperature are lower than a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E6" is carried out. A detecting signal An ON signal, When [smaller than a threshold predetermined in detection voltage and] detection temperature is beyond a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E7" is carried out, and when a detecting signal is smaller than a predetermined threshold in an off signal and a list or detection voltage and its detection temperature are low in them, reading appearance of the stroboscope charging-time set point (second) of "E8" is carried out.
[0111] In step S45, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0112] For example, when the stroboscope charging-time set point (second) of "E1" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "E1 (second)." Moreover, "E2" from CPU41, "E3", "E4", "E5", [for example,] When the stroboscope charging-time set point (second) of "E6", "E7", or "E8" is supplied, respectively, by the charging time of "E2 (second)", "E3", "E4", "E5", "E6", "E7", or "E8" Respectively, the stroboscope capacitor of the stroboscope device 72 is charged. In addition, the relation of power consumption is set to E4<<E3<E2<E1<E8<E7<E6<E5.
[0113] Thus, it becomes possible to be the more nearly optimal charging time and to charge the stroboscope capacitor of the stroboscope device 72 based on the class of cell by which image pick-up equipment 1 is contained by the battery pack 11 of a battery 2, cell voltage, and the ambient temperature of a cell.
[0114] Moreover, according to the class of cell contained by the battery box 11 of a battery 2, cell voltage, and the ambient temperature of a cell, it can carry out a zoom of the zoom device 45 (drawing 4) at the more nearly optimal zoom speed, or it not only charges the stroboscope capacitor of the stroboscope device 72 by the more nearly optimal charging time, but can display the display screen 62 (drawing 10) by the more nearly optimal lightness.
[0115] The example of a configuration in the case of controlling the zoom speed of the zoom device 45 according to cell classification above was shown in drawing 4 , the example of a configuration in the case of controlling the lightness of the display screen 62 according to cell classification was shown in drawing 7 , and the example of a configuration in the case of controlling the stroboscope charging time of the stroboscope device 72 according to cell classification was shown in drawing 10 . Furthermore, the example of a configuration in the case of controlling the stroboscope charging time of the stroboscope device 72 according to cell classification and cell voltage was shown in drawing 13 , and the example of a configuration in the case of controlling the stroboscope charging

time of the stroboscope device 72 according to cell classification, cell voltage, and the ambient temperature of a cell was shown in drawing 16 . These are separately illustrated, in order to give explanation intelligible, naturally, are the combination of arbitration and can control zoom speed, the lightness of a screen, and the stroboscope charging time.

[0116] The example of a configuration in that case is shown in drawing 19 . The table of the zoom speed set point according to the cell classification shown in memory 42 at drawing 5 , The table of the lightness set point according to the cell classification shown in drawing 8 , the table of the stroboscope charging-time set point according to the cell classification shown in drawing 11 , The table of the stroboscope charging-time set point according to the cell classification and cell voltage information which were shown in the table of the stroboscope charging-time set point according to the cell classification and cell voltage information which were shown in drawing 14 , and drawing 17 , and temperature information etc. is stored beforehand.

[0117] CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information which distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth, and is further supplied by the temperature detecting element 91 from the cell-voltage information supplied from the cell voltage detecting element 81.

[0118] CPU41 refers to memory 42 based on those distinction results. Read the corresponding zoom speed set point (drawing 5), and the zoom control section 43 is supplied. Make it make the zoom speed of the zoom device 45 control, or read the lightness set point (drawing 8), and the screen lightness control section 61 is supplied. It is made to make the lightness of the display screen 62 control, or the stroboscope charging-time set point (drawing 17) is read, the stroboscope charge control section 71 is supplied, and it is made to make the stroboscope charging time of the stroboscope device 72 control.

[0119] Moreover, CPU41 enables it to control only any one operating condition among the zoom speed of the zoom device 45, the lightness of the display screen 62, and the stroboscope charging time of the stroboscope device 72, enables it to control any two operating conditions, or can control all three operating conditions. In that case, it is also possible to change freely whether according to any one parameter, it controls among cell classification, cell voltage information, and temperature information, it controls according to any two parameters, or it controls according to all three parameters.

[0120] Therefore, the class of cell contained by the battery box 11 of a battery 2 with the image pick-up equipment 1 of this invention, It responds to the combination of the remaining condition of cell voltage, or the ambient temperature of a cell. Any one, any two, or all three operating conditions can be freely controlled among the zoom speed of the zoom device 45, the lightness of the display screen 62, or the stroboscope charging time of the stroboscope device 72, and it becomes possible to fully pull out the property of a cell.

[0121] In that case, you may make it change freely the operating condition a user wants to operate and control the input section which is not illustrated.

[0122] Although the example which applied this invention to image pick-up equipment 1 was explained above, it is possible to apply to other electronic equipment which can be driven not only with this but with the battery 2 widely.

[0123] moreover, the above -- setting -- the battery box 11 -- AA -- although it identified whether the mold cell 21-1 and 21-2 are contained or the box mold cell 31 would be contained by the cell pilot switch 15, the device in which not only this but three kinds or more of cells can be identified can be established, and each operating condition can also be controlled to be able to pull out the property of various cells to the maximum extent.

[0124] Although a series of processings mentioned above can also be performed by hardware, they can also be performed with software. When performing a series of processings with software, the program which constitutes the software is installed in a general-purpose personal computer etc. from a record medium possible [performing various kinds of functions] by installing the computer built into the hardware of dedication, or various kinds of programs.

[0125] The record medium which records the program which is installed in a computer and made into the condition which can be performed by computer As shown in drawing 4 , a magnetic disk 51 (a flexible disk is included), An optical disk 52 (CD-ROM and DVD (Digital Versatile Disc) are included), It is constituted by the package media which consist of a magneto-optic disk 53 (MD (Mini-Disc) (registered trademark) is included) or semiconductor memory 54, Flash ROM, a hard disk drive on which a program is recorded temporarily or permanently, etc. Record of the program to a record medium is performed through the interface of a router, a modem, etc. using the communication media of cables or wireless, such as networks, such as a public line network, a Local Area Network, or the Internet, and digital satellite broadcasting, if needed.

[0126] In addition, in this specification, even if the processing serially performed in accordance with the sequence that the step which describes the program recorded on a record medium was indicated is not of course necessarily processed serially, it is a juxtaposition thing also including the processing performed according to an individual.

[0127]

[Effect of the Invention] As mentioned above, according to this invention, the class of battery with which the electronic instrument was equipped is discriminable.

[0128] Moreover, according to this invention, the class of battery with which the electronic instrument was equipped is identified, and it becomes possible to change the operating condition of an electronic instrument according to the class.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] Especially this invention relates to a program at the electronic instrument which controlled predetermined actuation and the control method, a record medium, and a list according to the class of battery with which an electronic instrument is equipped about a program at an electronic instrument and the control method, a record medium, and a list.

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PRIOR ART

[Description of the Prior Art] the former and two AA -- it is possible to use the cell of various classes in the battery drive mold electronic instrument which makes a mold cell a power source.
[0003] AA -- in the case of a mold cell, two alkaline cells, two nickel primary cells, or two nickel rechargeable batteries can be used. Moreover, in the case of a box mold cell, for example, a lithium primary cell or a lithium secondary battery can be used.

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EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, according to this invention, the class of battery with which the electronic instrument was equipped is discriminable.
[0128] Moreover, according to this invention, the class of battery with which the electronic instrument was equipped is identified, and it becomes possible to change the operating condition of an electronic instrument according to the class.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, there is a big difference in the power capacity and the property of these cells. for example, two alkali -- AA -- a big difference is in power capacity, the impedance in the time of low temperature, and the impedance characteristic at the time of cell voltage reduction with a mold cell and a lithium primary cell.
[0005] That is, although the difference of the property of a cell is large, with the current battery drive mold electronic instrument, it is operating on the conditions same related always as the class of battery. Therefore, like a lithium primary cell, even if it was the battery of high capacity and low impedance, the technical problem which cannot pull out the merit to the maximum extent occurred.
[0006] This invention is made in view of such a condition, and enables it to change the operating condition of an electronic instrument according to the class of battery.

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MEANS

[Means for Solving the Problem] An electronic instrument of this invention is characterized by having an acquisition means supplied from power supply to acquire a signal which identifies classification of a cell, a judgment means to judge classification of a cell based on a signal acquired by acquisition means, and a control means which controls predetermined actuation of an electronic instrument based on a judgment result by judgment means.
[0008] A control means can be made to control to change at least one of zoom speed of an electronic instrument, lightness of a screen of an electronic instrument, or the stroboscope charging times of an electronic instrument.
[0009] A voltage detection means supplied from power supply to detect voltage of a cell can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on a judgment result by judgment means, and a voltage detection result by voltage detection means.
[0010] A temperature detection means supplied from power supply to detect ambient temperature of a cell can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on a judgment result by judgment means, and a temperature detection result by temperature detection means.
[0011] A voltage detection means supplied from power supply detect voltage of a cell, and a temperature detection means supplied from power supply detect ambient temperature of a cell can establish further, and a control means can make control predetermined actuation of an electronic instrument based on a judgment result by judgment means, a voltage detection result by voltage detection means, and a temperature detection result by temperature detection means.
[0012] A storage means memorize condition information for controlling predetermined actuation can be established further, and a control means can be made to control predetermined actuation of an electronic instrument based on condition information to which reading appearance of the condition information memorized by storage means was carried out, and it carried out reading appearance based on a judgment result by judgment means.
[0013] The control method of this invention carries out containing the acquisition control step which controls the acquisition of the signal which identifies the classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step as the feature.
[0014] The program currently recorded on the record medium of this invention carries out containing the acquisition control step which controls the acquisition of the signal which identifies the classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step as the feature.
[0015] The program of this invention makes a computer perform the acquisition control step which controls the acquisition of the signal which identifies classification of a cell supplied from power supply, the judgment step which judge the classification of said cell based on said signal with which acquisition was controlled by processing of an acquisition control step, and the control step control

predetermined actuation of an electronic instrument based on the judgment result by processing of a judgment step.

[0016] A signal which identifies classification of a cell supplied to an electronic instrument of this invention and a control method, and a list from power supply in a program is acquired, based on an acquired signal, classification of a cell is judged and predetermined actuation of an electronic instrument is controlled based on the judgment result.

[0017]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to drawing.

[0018] Drawing 1 is drawing showing the example of connection of image pick-up equipment 1 and a battery 2 which applied this invention.

[0019] It is the image pick-up device which consists of a still camera, a digital camera, or a camcorder, and image pick-up equipment 1 changes the zoom speed of the zoom device 45 (drawing 4), the lightness of the display screen 62 (drawing 7), or the stroboscope charging time of the stroboscope device 72 (drawing 10) according to the classification of the cell of the battery 2 with which it is equipped.

[0020] As shown in this drawing, the applied part which image pick-up equipment 1 does not illustrate is equipped with the battery 2, and it supplies power to image pick-up equipment 1.

[0021] Drawing 2 is drawing showing the example of a configuration of a battery 2. Drawing 2 A shows the appearance perspective diagram of a battery 2, and drawing 2 B shows the side cross section seen from [of drawing 2 A] arrow head P.

[0022] The battery 2 consists of cell classification judging devices 12 for distinguishing the battery box (cell receipt device) 11 for containing a cell 21-1 and 21-2, and the class of cell. The cell classification judging device 12 consists of a movable threshold 13, a spring 14, and a cell pilot switch 15 further.

[0023] The movable threshold 13 is supported with the spring 14, and is made by down possible movable among drawing 2 B. The cell pilot switch 15 is connected to the movable threshold 13 through the spring 14. Usually, a spring 14 will expand and contract, and although the cell pilot switch 15 is in an off condition, if movable [of the movable threshold 13] is carried out to down, the force (energization force) which is going to press the cell pilot switch 15 will work. Thus, as for the cell pilot switch 15, it switches on using the energization force of a spring 14. The cell pilot switch 15 supplies ON/OFF (ON/OFF) signal of a switch to image pick-up equipment 1.

[0024] AA -- the mold cell 21-1 and 21-2 consist of an alkaline cell, a nickel primary cell, or a nickel rechargeable battery, and as shown in the dotted line arrow head of drawing 2 A, they are contained by the battery box 11. in this case, AA -- since the mold cell 21-1 and 21-2 are contained by the battery box 11 on both sides of the movable threshold 13, movable [of the movable threshold 13] is not carried out to down [in drawing 2 B] namely, AA -- when the mold cell 21-1 and 21-2 are contained by the battery box 11, the cell pilot switch 15 is still an off condition.

[0025] Drawing 3 is drawing showing other examples of a configuration of a battery 2. Drawing 3 A shows the appearance perspective diagram of a battery 2, and drawing 3 B shows the side cross section seen from [of drawing 3 A] arrow head Q. In addition, the same sign is given to drawing 2 and a corresponding portion, and the explanation is omitted suitably.

[0026] the box mold cell 31 -- AA -- it consists of a lithium primary cell which has the width of face of two duties of a mold cell, or a lithium secondary battery, and it is contained by the battery box 11 as shown in the dotted line arrow head of drawing 3 A. In this case, movable [of the movable threshold 13] is carried out to down [in drawing 3 B] by the box mold cell 31 being contained by the battery box 11. That is, when the box mold cell 31 is contained by the battery box 11, the cell pilot switch 15 changes in the condition of ON.

[0027] Drawing 4 is drawing showing the example of a configuration inside image pick-up equipment 1 and a battery 2 shown in drawing 1 .

[0028] CPU41 distinguishes the class of cell with which it is equipped from the ON or the off detecting signal supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2. CPU41 reads the corresponding zoom speed set point (drawing 5) with reference to memory 42 based on a distinction result, and supplies it to the zoom control section 43.

[0029] The table of the zoom speed set point of the zoom device 45 according to cell classification is beforehand stored in memory 42. Moreover, memory 42 may store the data of immobilization fundamentally of the parameters the program which CPU41 uses, and for an operation, or you may make it store a variable parameter etc. suitably in program execution.
[0030] With reference to drawing 5 , the example of the table of the zoom speed set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the zoom speed set point is stored.
[0031] In the example of drawing 5 , corresponding to the detecting signal of "OFF", the zoom speed set point (second) of "A1 (late)" is recorded, and the zoom speed set point (second) of "A2 (quick)" is recorded corresponding to the detecting signal of "ON."
[0032] In addition, you may make it make the value which changed the time amount of "A1" and "A2" by the predetermined calculation method store in memory 42.
[0033] It returns to explanation of drawing 4 . The zoom control section 43 is controlled based on the zoom speed set point supplied from CPU41 to change the zoom speed of the zoom device 45.
[0034] Drive 44 is connected to CPU41 again if needed, and drive 44 is equipped with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54 if needed. Drive 44 reads the data or the program currently recorded on a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and supplies the data or program to CPU41 or memory 42.
[0035] Although hereafter explained to memory 42 as that in which the table of the zoom speed set point according to cell classification is stored beforehand Drive 44 is connected not only to this but to CPU41. To drive 44 It is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, reading appearance of the table of the zoom speed set point currently recorded on them is carried out, and you may make it make it store in memory 42.
[0036] By the way, in image pick-up equipment 1, in order to make the zoom device 45 drive at a quicker zoom speed, larger power is needed for a short time. That is, when the cell engine performance is inferior, if you are going to make it drive at a quick zoom speed, the life of a cell will get worse.
[0037] the AA which showed the box mold cell 31 shown in drawing 3 to drawing 2 -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- even if it makes the zoom device 45 drive at a quicker zoom speed, there is less effect which it has on the life of a cell than the time of mold cell use.
[0038] Then, when the detecting signal supplied from the cell pilot switch 15 with the image pick-up equipment 1 shown in drawing 4 is an ON signal (at the time of use of the box mold cell 31), The zoom device 45 drives at a quicker zoom speed, and when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), it is made for the zoom device 45 to drive at the usual speed (or speed later than the zoom speed at the time of use of the box mold cell 31).
[0039] Next, with reference to the flow chart of drawing 6 , the zoom speed control processing which the image pick-up equipment 1 of drawing 4 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.
[0040] In step S1, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S2, CPU41 reads the corresponding zoom speed set point (drawing 5) with reference to memory 42 based on the distinction result by processing of step S1, and supplies it to the zoom control section 43.
[0041] For example, when a detecting signal is an off signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the zoom speed set point (second) of "A1 (late)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the zoom speed set point (second) of "A2 (quick)" is carried out.
[0042] In step S3, the zoom control section 43 controls the zoom speed of the zoom device 45 based on the zoom speed set point supplied from CPU41.
[0043] For example, when the zoom speed set point (second) of "A1 (late)" is supplied from CPU41, the zoom device 45 drives at the zoom speed of "A1 (second)." When the zoom speed set point (second) of "A2 [moreover,] (quick)" is supplied from CPU41, the zoom device 45 drives at the

zoom speed of "A2 (second)." In addition, the relation of power consumption is set to A1<A2.
[0044] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to make the zoom device 45 drive at a zoom speed quicker than the time of the mold cell 21-1 and use of 21-2.
[0045] Moreover, it not only controls image pick-up equipment 1, but according to the class of cell contained by the battery box 11 of a battery 2, lightness, the stroboscope charging time, etc. of the display screen can control it to change other operating conditions to change the zoom speed of the zoom device 45. It will explain in order about the example of a configuration in the case of controlling hereafter to change other operating conditions, and its actuation.
[0046] Drawing 7 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 4 and a corresponding portion, and the explanation is omitted suitably.
[0047] The table of the lightness set point of the display screen 62 according to cell classification is beforehand stored in memory 42. Of course, drive 44 is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and reading appearance of the table of the lightness set point currently recorded by them is carried out, and you may make it make it to connect drive 44 to CPU41 and store in memory 42.
[0048] With reference to drawing 8 , the example of the table of the lightness set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the lightness set point is stored.
[0049] In the example of drawing 8 , corresponding to the detecting signal of "OFF", the lightness set point (cd/m2) of "B1 (dark)" is recorded, and the lightness set point (cd/m2) of "B-2 (bright)" is recorded corresponding to the detecting signal of "ON."
[0050] In addition, you may make it make the value which changed the brightness of "B1" and "B-2" by the predetermined calculation method store in memory 42.
[0051] It returns to explanation of drawing 8 . CPU41 distinguishes the class of cell with which it is equipped from the ON or the off detecting signal supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2. CPU41 reads the corresponding lightness set point (drawing 8) with reference to memory 42 based on a distinction result, and supplies it to the screen lightness control section 61.
[0052] The screen lightness control section 61 is controlled based on the lightness set point supplied from CPU41 to change the lightness of the display screen 62.
[0053] The display screen 62 consists of thin indicating equipments, such as a liquid crystal display, receives data from CPU41 and displays an image or an alphabetic character corresponding to the received data etc.
[0054] By the way, in image pick-up equipment 1, in order to display the display screen 62 more brightly, larger power is needed. That is, when the cell engine performance is inferior, if it is going to display the display screen 62 brightly, the life of a cell will get worse.
[0055] the AA shown in drawing 2 as the box mold cell 31 shown in drawing 3 was mentioned above -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- though the display screen 62 is displayed more brightly, there is less effect which it has on the life of a cell than the time of mold cell use.
[0056] So, when the detecting signal supplied from the cell pilot switch 15 is an ON signal (at the time of use of the box mold cell 31), the display screen 62 is displayed more brightly, and when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), the display screen (or more darkly than the brightness at the time of use of the box mold cell 31) 62 is expressed as the image pick-up equipment 1 shown in drawing 7 with the usual brightness.
[0057] Next, with reference to the flow chart of drawing 9 , the screen lightness control processing which the image pick-up equipment 1 of drawing 7 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.
[0058] In step S11, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S12, CPU41 reads

the corresponding lightness set point (drawing 8) with reference to memory 42 based on the distinction result by processing of step S11, and supplies it to the screen lightness control section 61.
[0059] For example, when a detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the lightness set point (cd/m2) of "B1 (dark)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the lightness set point (cd/m2) of "B-2 (bright)" is carried out.
[0060] In step S13, the screen lightness control section 61 controls the lightness of the display screen 62 based on the lightness set point supplied from CPU41.
[0061] For example, when the lightness set point (cd/m2) of "B1 (dark)" is supplied from CPU41, the display screen 62 is displayed with the brightness of "B1 (cd/m2)." When the lightness set point (cd/m2) of "B-2 [moreover,] (bright)" is supplied from CPU41, the display screen 62 is displayed with the brightness of "B-2 (cd/m2)." In addition, the relation of power consumption serves as B1<B-2.
[0062] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to display the display screen 62 more brightly than the time of the mold cell 21-1 and use of 21-2.
[0063] Drawing 10 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 4 and a corresponding portion, and the explanation is omitted suitably.
[0064] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification is beforehand stored in memory 42. Of course, drive 44 is made to equip with a magnetic disk 51, an optical disk 52, a magneto-optic disk 53, or semiconductor memory 54, and reading appearance of the table of the stroboscope charging-time set point currently recorded by them is carried out, and you may make it make it to connect drive 44 to CPU41 and store in memory 42.
[0065] With reference to drawing 11 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, and the stroboscope charging-time set point is stored.
[0066] In the example of drawing 11 , corresponding to the detecting signal of "OFF", the stroboscope charging-time set point (second) of "C1 (late)" is recorded, and the stroboscope charging-time set point (second) of "C2 (quick)" is recorded corresponding to the detecting signal of "ON."
[0067] In addition, you may make it make the value which changed the time amount of "C1" and "C2" by the predetermined calculation method store in memory 42.
[0068] It returns to explanation of drawing 10 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal. CPU41 reads the corresponding stroboscope charging-time set point (drawing 11) with reference to memory 42 based on a distinction result, and supplies it to the stroboscope charge control section 71.
[0069] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor (not shown) of the stroboscope device 72.
[0070] By the way, in image pick-up equipment 1, in order to charge the stroboscope capacitor of the stroboscope device 72 more quickly, larger power is needed for a short time. That is, when the cell engine performance is inferior, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.
[0071] the AA shown in drawing 2 as the box mold cell 31 shown in drawing 3 was mentioned above -- the mold cell 21-1 and 21-2 -- cell capacity -- large -- since the battery impedance is small -- AA -- even if it carries out stroboscope charge by shorter time amount, there is less effect which it has on the life of a cell than the time of mold cell use.
[0072] Then, when the detecting signal supplied from the cell pilot switch 15 with the image pick-up equipment 1 shown in drawing 10 is an ON signal (at the time of use of the box mold cell 31), The stroboscope capacitor of the stroboscope device 72 is charged by the shorter charging time. When a

detecting signal is an OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), the stroboscope capacitor of the stroboscope device 72 is charged by the usual charging time (or time amount longer than the charging time at the time of use of the box mold cell 31).

[0073] Next, with reference to the flow chart of drawing 12 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 10 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, and the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2.

[0074] In step S21, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S22, CPU41 reads the corresponding stroboscope charging-time set point (drawing 11) with reference to memory 42 based on the distinction result by processing of step S21, and supplies it to the SUTOBORO charge control section 71.

[0075] For example, when a detecting signal is an off signal (at the time [1 AA mold cell 21- 21] of use of -2), reading appearance of the stroboscope charging-time set point (second) of "C1 (late)" is carried out, and when a detecting signal is an ON signal (at the time of use of the box mold cell 31), reading appearance of the stroboscope charging-time set point (second) of "C2 (quick)" is carried out.

[0076] In step S23, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0077] For example, when the stroboscope charging-time set point (second) of "C1 (late)" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "C1 (second)." When the stroboscope charging-time set point (second) of "C [moreover,]2 (quick)" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "C2 (second)." In addition, the relation of power consumption serves as C1<C2.

[0078] thus, the class of cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2 -- distinguishing -- the time of use of the box mold cell 31 -- AA -- it becomes possible to charge the stroboscope capacitor of the stroboscope device 72 by the charging time shorter than the time of the mold cell 21-1 and use of 21-2.

[0079] Drawing 13 is drawing showing the example of a configuration inside [other] the battery 2 of the image pick-up equipment 1 shown in drawing 1 . In addition, the same sign is given to drawing 10 and a corresponding portion, and the explanation is omitted suitably. Except that the cell voltage detecting element 81 is newly formed in the battery 2 in the case of the example of drawing 13 , it considers as the same configuration as drawing 10 .

[0080] The cell voltage detecting element 81 detects the voltage of the cell contained by the battery box 11, and supplies cell voltage information (detection voltage) to image pick-up equipment 1.

[0081] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification and cell voltage information is beforehand stored in memory 42.

[0082] With reference to drawing 14 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the cell voltage information (detection voltage) supplied from the detecting signal and the cell voltage detecting element 81 which are supplied from the cell pilot switch 15, and the stroboscope charging-time set point is stored. In addition, Vbatt expresses detection voltage and Vth expresses the voltage of a predetermined threshold.

[0083] In the example of drawing 14 , it corresponds to the detecting signal of "OFF", and the detection voltage of "Vbatt>=Vth." The stroboscope charging-time set point (second) of "D1" is recorded, and it corresponds to the detecting signal of "OFF", and the detection voltage of "Vbatt<Vth." The stroboscope charging-time set point (second) of "D2" is recorded, and it corresponds to the detecting signal of "ON", and the detection voltage of "Vbatt>=Vth." The stroboscope charging-time set point (second) of "D3" is recorded, and the stroboscope charging-time set point (second) of "D4" is recorded corresponding to the detecting signal of "ON", and the detection voltage of "Vbatt<Vth."

[0084] It returns to explanation of drawing 13 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81. CPU41 reads the corresponding stroboscope charging-time set point (drawing 14) with reference to memory 42 based on those distinction results, and supplies it to the stroboscope charge control section 71.
[0085] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor of the stroboscope device 72.
[0086] By the way, as a property of a common cell, when cell voltage falls, a cell property gets worse by internal impedance increasing etc. That is, in image pick-up equipment 1, when cell voltage falls, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.
[0087] Then, when the detection voltage to which the detecting signal supplied from the cell pilot switch 15 is supplied from the cell voltage detecting element 81 in the image pick-up equipment 1 shown in drawing 13 by the ON signal (at the time of use of the box mold cell 31) is beyond a predetermined threshold, The stroboscope capacitor of the stroboscope device 72 is charged by the shortest charging time. When a detecting signal is smaller than a threshold predetermined in detection voltage by the ON signal, the stroboscope device 72 is charged by the charging time shorter than usual. When a detecting signal is beyond a threshold predetermined in detection voltage by the OFF signal (at the time [1 AA mold cell 21- 21] of use of -2), The stroboscope device 72 is charged by the usual charging time, and when a detecting signal is smaller than a threshold predetermined in detection voltage by the off signal, the stroboscope device 72 is charged by the charging time longer than usual.
[0088] Next, with reference to the flow chart of drawing 15 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 13 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, and detection voltage shall be supplied from the cell voltage detecting element 81.
[0089] In step S31, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S32, CPU41 distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81.
[0090] In step S33, CPU41 reads the corresponding stroboscope charging-time set point (drawing 14) with reference to memory 42 based on a detecting signal and cell voltage information based on the distinction result by processing of steps S31 and S32, and supplies it to the SUTOBORO charge control section 71.
[0091] For example, when a detecting signal is beyond a threshold predetermined in detection voltage by the off signal (at the time [1 AA mold cell 21- 21] of use of -2), When reading appearance of the stroboscope charging-time set point (second) of "D1" is carried out and a detecting signal is smaller than a threshold predetermined in detection voltage by the off signal, When reading appearance of the stroboscope charging-time set point (second) of "D2" was carried out and a detecting signal is beyond a threshold predetermined in detection voltage by the ON signal (at the time of use of the box mold cell 31), Reading appearance of the stroboscope charging-time set point (second) of "D3" is carried out, and when a detecting signal is smaller than a threshold predetermined in detection voltage by the ON signal, reading appearance of the stroboscope charging-time set point (second) of "D4" is carried out.
[0092] In step S34, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0093] For example, when the stroboscope charging-time set point (second) of "D1" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "D1 (second)." When the stroboscope charging-time set point (second) of moreover, "D2", "D3", or "D4" is supplied from CPU41, respectively, the stroboscope capacitor of the stroboscope device 72

is charged, respectively by the charging time of "D2 (second)", "D3 (second)", or "D4 (second)." In addition, the relation of power consumption serves as D2<D1<D4<D3.
[0094] Thus, it becomes possible to be the optimal charging time and to charge the stroboscope capacitor of the stroboscope device 72 based on the class and cell voltage of the cell by which image pick-up equipment 1 is contained by the battery box 11 of a battery 2.
[0095] Moreover, according to the class and cell voltage of a cell which are contained by the battery box 11 of a battery 2, it can carry out a zoom of the zoom device 45 (drawing 4) at the optimal zoom speed, or it not only charges the stroboscope capacitor of the stroboscope device 72 by the optimal charging time, but can display the display screen 62 (drawing 10) by the optimal lightness.
[0096] Drawing 16 is drawing showing the example of a configuration inside [other] image pick-up equipment 1 and a battery 2 shown in drawing 1 . In addition, the same sign is given to drawing 13 and a corresponding portion, and the explanation is omitted suitably. Except that the temperature detecting element 91 is newly formed in the battery 2 in the case of the example of drawing 16 , it considers as the same configuration as drawing 13 .
[0097] The temperature detecting element 91 detects the ambient temperature of the cell contained by the battery box 11, and supplies temperature information (detection temperature) to image pick-up equipment 1.
[0098] The table of the stroboscope charging-time set point of the stroboscope device 72 according to cell classification, cell voltage information, and temperature information is beforehand stored in memory 42.
[0099] With reference to drawing 17 , the example of the table of the stroboscope charging-time set point currently recorded on memory 42 is explained here. As shown in this drawing, it matches with the detecting signal supplied from the cell pilot switch 15, the cell voltage information (detection voltage) supplied from the cell voltage detecting element 81, and the temperature information (detection temperature) supplied from the temperature detecting element 91, and the stroboscope charging-time set point is stored. In addition, Vbatt expresses detection voltage and Vth expresses the voltage of a predetermined threshold. Moreover, T expresses detection temperature and Tth expresses the temperature of a predetermined threshold.
[0100] In the example of drawing 17 , it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E1" is recorded, and it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T<Tth." The stroboscope charging-time set point (second) of "E2" is recorded, and it corresponds to the detecting signal of "OFF", the detection voltage of "Vbatt<Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E3" is recorded, and the stroboscope charging-time set point (second) of "E4" is recorded corresponding to the detecting signal of "OFF", the detection voltage of "Vbatt<Vth", and the detection temperature of "T<Tth."
[0101] Moreover, it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E5" is recorded, and it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt>=Vth", and the detection temperature of "T<Tth." The stroboscope charging-time set point (second) of "E6" is recorded, and it corresponds to the detecting signal of "ON", the detection voltage of "Vbatt<Vth", and the detection temperature of "T>=Tth." The stroboscope charging-time set point (second) of "E7" is recorded, and the stroboscope charging-time set point (second) of "E8" is recorded corresponding to the detecting signal of "ON", the detection voltage of "Vbatt<Vth", and the detection temperature of "T<Tth."
[0102] It returns to explanation of drawing 16 . CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information which distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth, and is further supplied by the temperature detecting element 91 from the cell-voltage information supplied from the cell voltage detecting element 81. CPU41 reads the corresponding stroboscope charging-time set point (drawing 17) with reference to memory 42 based on those

distinction results, and supplies it to the stroboscope charge control section 71.
[0103] The stroboscope charge control section 71 is controlled based on the stroboscope charging-time set point supplied from CPU41 to change the charging time of the stroboscope capacitor of the stroboscope device 72.
[0104] By the way, as a property of a common cell, when ambient temperature falls, a cell property gets worse by internal impedance increasing etc. That is, in image pick-up equipment 1, when ambient temperature falls, if it is going to shorten the stroboscope charging time, the life of a cell will get worse.
[0105] With the image pick-up equipment 1 shown in drawing 16 , the detecting signal supplied from the cell pilot switch 15 Then, an ON signal (at the time of use of the box mold cell 31), When it is beyond a threshold predetermined in the detection voltage supplied from the cell voltage detecting element 81, and beyond a threshold predetermined in the detection temperature supplied from the temperature detecting element 91, The stroboscope device 72 is charged by the shortest charging time. A detecting signal An off signal (at the time [1 AA mold cell 21- 21] of use of -2), When [smaller than a threshold predetermined in detection voltage and] lower than a threshold predetermined in detection temperature, the stroboscope device 72 is charged by the longest charging time, and the stroboscope device 72 is similarly charged by the optimal charging time according to a detecting signal, detection voltage, and detection temperature.
[0106] Next, with reference to the flow chart of drawing 18 , the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 16 performs is explained. In starting this processing, image pick-up equipment 1 shall be equipped with the battery 2, the detecting signal shall be supplied to it from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, detection voltage shall be supplied from the cell voltage detecting element 81, and detection temperature shall be further supplied from the temperature detecting element 91.
[0107] In step S41, CPU41 of image pick-up equipment 1 distinguishes whether the detecting signal supplied from the cell pilot switch 15 is an ON signal, or it is an off signal. In step S42, CPU41 distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth from the cell voltage information supplied from the cell voltage detecting element 81. In step S43, CPU41 distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information supplied from the temperature detecting element 91.
[0108] In step S44, CPU41 reads the corresponding stroboscope charging-time set point (drawing 17) with reference to memory 42 based on a detecting signal, cell voltage information, and temperature information based on step S41 thru/or the distinction result by processing of S43, and supplies it to the SUTOBORO charge control section 71.
[0109] A detecting signal For example, an off signal (at the time [1 AA mold cell 21- 21] of use of -2), When detection voltage and detection temperature are beyond predetermined thresholds, reading appearance of the stroboscope charging-time set point (second) of "E1" is carried out to a list. When beyond a threshold predetermined [detecting signal] in off signal and detection voltage and detection temperature are lower than a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E2" is carried out. A detecting signal An off signal, When [smaller than a threshold predetermined in detection voltage and] detection temperature is beyond a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E3" is carried out, and when a detecting signal is smaller than a predetermined threshold in an off signal and a list or detection voltage and its detection temperature are low in them, reading appearance of the stroboscope charging-time set point (second) of "E4" is carried out.
[0110] For example, a detecting signal Moreover, an ON signal (at the time of use of the box mold cell 31), When detection voltage and detection temperature are beyond predetermined thresholds, reading appearance of the stroboscope charging-time set point (second) of "E5" is carried out to a list. When beyond a threshold predetermined [detecting signal] in an ON signal and detection voltage and detection temperature are lower than a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E6" is carried out. A detecting signal An ON signal, When [smaller than a threshold predetermined in detection voltage and] detection temperature is beyond a predetermined threshold, Reading appearance of the stroboscope charging-time set point (second) of "E7" is carried out, and when a detecting signal is smaller than a

predetermined threshold in an off signal and a list or detection voltage and its detection temperature are low in them, reading appearance of the stroboscope charging-time set point (second) of "E8" is carried out.

[0111] In step S45, the stroboscope charge control section 71 controls the stroboscope charging time of the stroboscope device 72 based on the stroboscope charging-time set point supplied from CPU41.

[0112] For example, when the stroboscope charging-time set point (second) of "E1" is supplied from CPU41, the stroboscope capacitor of the stroboscope device 72 is charged by the charging time of "E1 (second)." Moreover, "E2" from CPU41, "E3", "E4", "E5", [for example,] When the stroboscope charging-time set point (second) of "E6", "E7", or "E8" is supplied, respectively, by the charging time of "E2 (second)", "E3", "E4", "E5", "E6", "E7", or "E8" Respectively, the stroboscope capacitor of the stroboscope device 72 is charged. In addition, the relation of power consumption is set to E4<<E3<E2<E1<E8<E7<E6<E5.

[0113] Thus, it becomes possible to be the more nearly optimal charging time and to charge the stroboscope capacitor of the stroboscope device 72 based on the class of cell by which image pick-up equipment 1 is contained by the battery pack 11 of a battery 2, cell voltage, and the ambient temperature of a cell.

[0114] Moreover, according to the class of cell contained by the battery box 11 of a battery 2, cell voltage, and the ambient temperature of a cell, it can carry out a zoom of the zoom device 45 (drawing 4) at the more nearly optimal zoom speed, or it not only charges the stroboscope capacitor of the stroboscope device 72 by the more nearly optimal charging time, but can display the display screen 62 (drawing 10) by the more nearly optimal lightness.

[0115] The example of a configuration in the case of controlling the zoom speed of the zoom device 45 according to cell classification above was shown in drawing 4 , the example of a configuration in the case of controlling the lightness of the display screen 62 according to cell classification was shown in drawing 7 , and the example of a configuration in the case of controlling the stroboscope charging time of the stroboscope device 72 according to cell classification was shown in drawing 10 . Furthermore, the example of a configuration in the case of controlling the stroboscope charging time of the stroboscope device 72 according to cell classification and cell voltage was shown in drawing 13 , and the example of a configuration in the case of controlling the stroboscope charging time of the stroboscope device 72 according to cell classification, cell voltage, and the ambient temperature of a cell was shown in drawing 16 . These are separately illustrated, in order to give explanation intelligible, naturally, are the combination of arbitration and can control zoom speed, the lightness of a screen, and the stroboscope charging time.

[0116] The example of a configuration in that case is shown in drawing 19 . The table of the zoom speed set point according to the cell classification shown in memory 42 at drawing 5 , The table of the lightness set point according to the cell classification shown in drawing 8 , the table of the stroboscope charging-time set point according to the cell classification shown in drawing 11 , The table of the stroboscope charging-time set point according to the cell classification and cell voltage information which were shown in the table of the stroboscope charging-time set point according to the cell classification and cell voltage information which were shown in drawing 14 , and drawing 17 , and temperature information etc. is stored beforehand.

[0117] CPU41 distinguishes the class of cell contained by the battery box 11 from the ON supplied from the cell pilot switch 15 of the cell classification judging device 12 of a battery 2, or an off detecting signal, and distinguishes whether the detection temperature T is larger than the predetermined threshold Tth from the temperature information which distinguishes whether the detection voltage Vbatt is larger than the predetermined threshold Vth, and is further supplied by the temperature detecting element 91 from the cell-voltage information supplied from the cell voltage detecting element 81.

[0118] CPU41 refers to memory 42 based on those distinction results. Read the corresponding zoom speed set point (drawing 5), and the zoom control section 43 is supplied. Make it make the zoom speed of the zoom device 45 control, or read the lightness set point (drawing 8), and the screen lightness control section 61 is supplied. It is made to make the lightness of the display screen 62 control, or the stroboscope charging-time set point (drawing 17) is read, the stroboscope charge

control section 71 is supplied, and it is made to make the stroboscope charging time of the stroboscope device 72 control.

[0119] Moreover, CPU41 enables it to control only any one operating condition among the zoom speed of the zoom device 45, the lightness of the display screen 62, and the stroboscope charging time of the stroboscope device 72, enables it to control any two operating conditions, or can control all three operating conditions. In that case, it is also possible to change freely whether according to any one parameter, it controls among cell classification, cell voltage information, and temperature information, it controls according to any two parameters, or it controls according to all three parameters.

[0120] Therefore, the class of cell contained by the battery box 11 of a battery 2 with the image pick-up equipment 1 of this invention, It responds to the combination of the remaining condition of cell voltage, or the ambient temperature of a cell. Any one, any two, or all three operating conditions can be freely controlled among the zoom speed of the zoom device 45, the lightness of the display screen 62, or the stroboscope charging time of the stroboscope device 72, and it becomes possible to fully pull out the property of a cell.

[0121] In that case, you may make it change freely the operating condition a user wants to operate and control the input section which is not illustrated.

[0122] Although the example which applied this invention to image pick-up equipment 1 was explained above, it is possible to apply to other electronic equipment which can be driven not only with this but with the battery 2 widely.

[0123] moreover, the above -- setting -- the battery box 11 -- AA -- although it identified whether the mold cell 21-1 and 21-2 are contained or the box mold cell 31 would be contained by the cell pilot switch 15, the device in which not only this but three kinds or more of cells can be identified can be established, and each operating condition can also be controlled to be able to pull out the property of various cells to the maximum extent.

[0124] Although a series of processings mentioned above can also be performed by hardware, they can also be performed with software. When performing a series of processings with software, the program which constitutes the software is installed in a general-purpose personal computer etc. from a record medium possible [performing various kinds of functions] by installing the computer built into the hardware of dedication, or various kinds of programs.

[0125] The record medium which records the program which is installed in a computer and made into the condition which can be performed by computer As shown in drawing 4 , a magnetic disk 51 (a flexible disk is included), An optical disk 52 (CD-ROM and DVD (Digital Versatile Disc) are included), It is constituted by the package media which consist of a magneto-optic disk 53 (MD (Mini-Disc) (registered trademark) is included) or semiconductor memory 54, Flash ROM, a hard disk drive on which a program is recorded temporarily or permanently, etc. Record of the program to a record medium is performed through the interface of a router, a modem, etc. using the communication media of cables or wireless, such as networks, such as a public line network, a Local Area Network, or the Internet, and digital satellite broadcasting, if needed.

[0126] In addition, in this specification, even if the processing serially performed in accordance with the sequence that the step which describes the program recorded on a record medium was indicated is not of course necessarily processed serially, it is a juxtaposition thing also including the processing performed according to an individual.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the example of connection of image pick-up equipment and a battery which applied this invention.
[Drawing 2] It is drawing showing the example of a configuration of a battery.
[Drawing 3] It is drawing showing other examples of a configuration of a battery.
[Drawing 4] It is drawing showing the example of a configuration inside image pick-up equipment and a battery.
[Drawing 5] It is drawing showing the example of the table of the zoom speed set point currently recorded on the memory of drawing 4 .
[Drawing 6] It is a flow chart explaining the zoom speed control processing which the image pick-up equipment of drawing 4 performs.
[Drawing 7] It is drawing showing other examples of a configuration inside image pick-up equipment and a battery.
[Drawing 8] It is drawing showing the example of the table of the lightness set point currently recorded on the memory of drawing 7 .
[Drawing 9] It is a flow chart explaining the screen lightness control processing which the image pick-up equipment of drawing 7 performs.
[Drawing 10] It is drawing showing other examples of a configuration inside image pick-up equipment and a battery.
[Drawing 11] It is drawing showing the example of the table of the stroboscope charging-time set point currently recorded on the memory of drawing 10 .
[Drawing 12] It is a flow chart explaining the stroboscope charging-time control processing which the image pick-up equipment of drawing 10 performs.
[Drawing 13] It is drawing showing other examples of a configuration inside image pick-up equipment and a battery.
[Drawing 14] It is drawing showing the example of the table of the stroboscope charging-time set point currently recorded on the memory 42 of drawing 13 .
[Drawing 15] It is a flow chart explaining the stroboscope charging-time control processing which the image pick-up equipment of drawing 13 performs.
[Drawing 16] It is drawing showing other examples of a configuration inside image pick-up equipment and a battery.
[Drawing 17] It is drawing showing the example of the table of the stroboscope charging-time set point currently recorded on the memory 42 of drawing 16 .
[Drawing 18] It is a flow chart explaining the stroboscope charging-time control processing which the image pick-up equipment 1 of drawing 16 performs.
[Drawing 19] It is drawing showing other examples of a configuration inside image pick-up equipment and a battery.
[Description of Notations]
1 Image Pick-up Equipment 2 Battery 11 battery box 12 A cell classification judging device, 13 Movable threshold 14 A spring, 15 A cell pilot switch, 21-1, and 21-2 -- AA -- mold cell 31 a box mold cell -- 41 CPU, 42 Memory 43 zoom control section 45 Zoom device 61 Screen lightness control section 62 Display screen 71 Stroboscope charge control section 72 Stroboscope device 81

Cell voltage detecting element 91 Temperature detecting element

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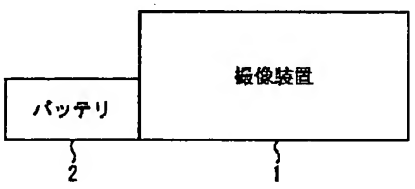
[Translation done.]

* NOTICES *

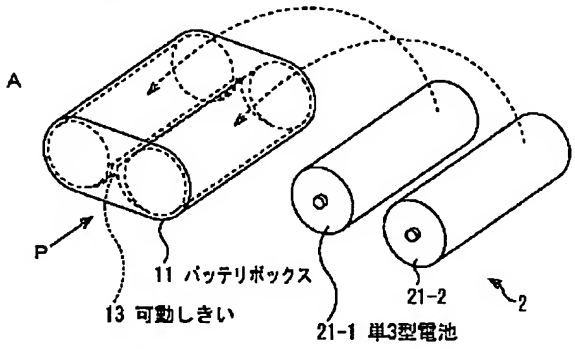
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

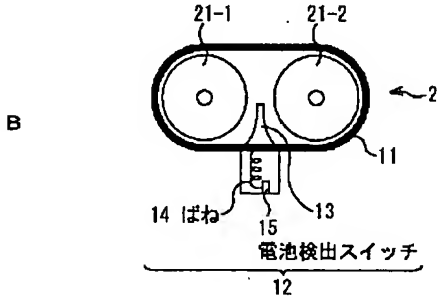
DRAWINGS

[Drawing 1]
図1



[Drawing 2]
図2



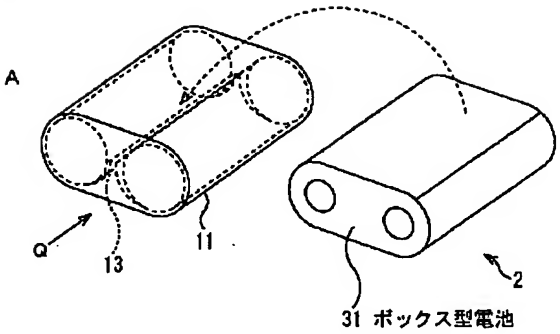


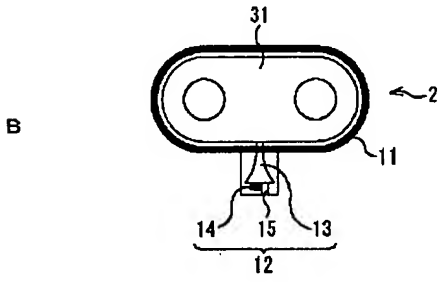
[Drawing 5]
図5

検出信号	ズームスピード設定値(秒)
OFF	A1(遅い)
ON	A2(速い)

[Drawing 3]

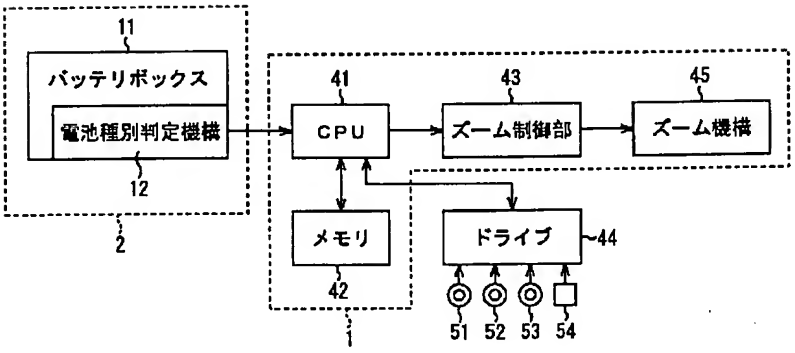
図3





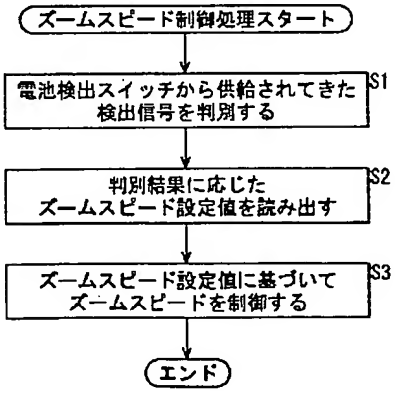
[Drawing 4]

図4



[Drawing 6]

図6



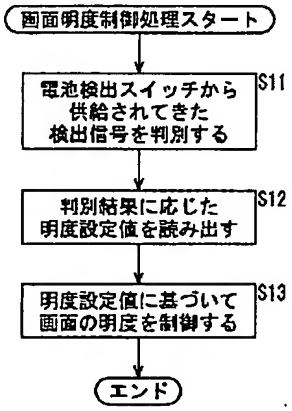
[Drawing 8]

図8

検出信号	明度設定値 (cd/m^2)
OFF	B1(暗い)
ON	B2(明るい)

[Drawing 9]

図9



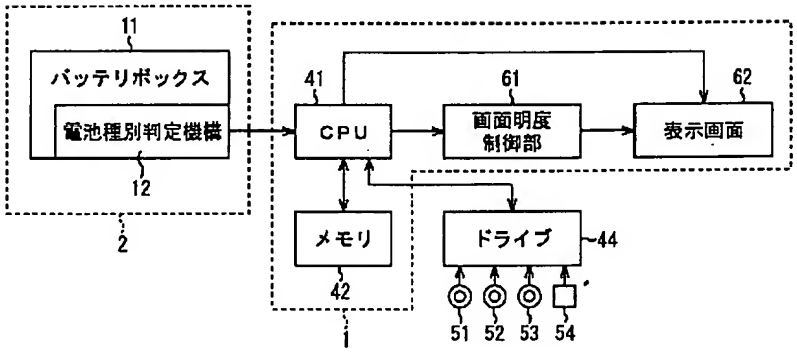
[Drawing 11]

図11

検出信号	ストロボ充電時間設定値(秒)
OFF	C1(遅い)
ON	C2(速い)

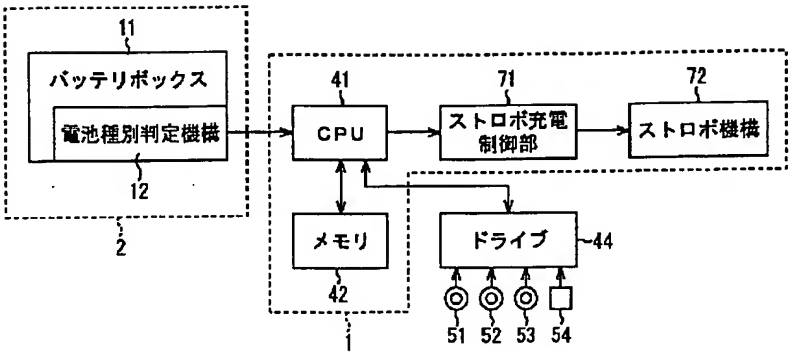
[Drawing 7]

図7



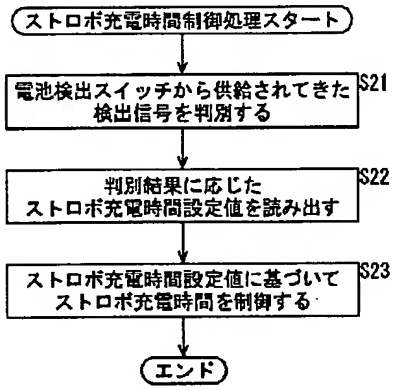
[Drawing 10]

図10



[Drawing 12]

図12



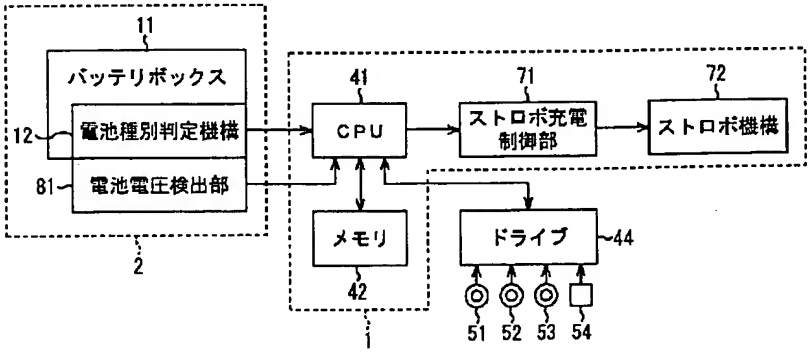
[Drawing 14]

図14

検出信号	検出電圧Vbatt	ストロボ充電時間設定値(秒)
OFF	Vbatt≧Vth	D1
OFF	Vbatt<Vth	D2
ON	Vbatt≧Vth	D3
ON	Vbatt<Vth	D4

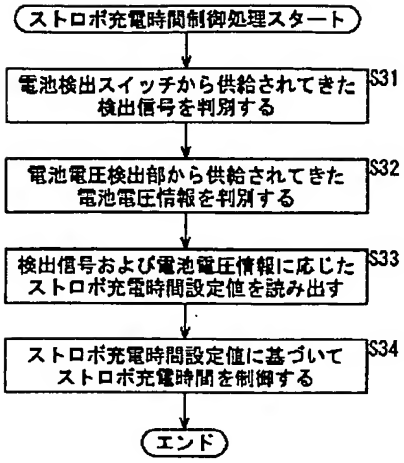
[Drawing 13]

図13



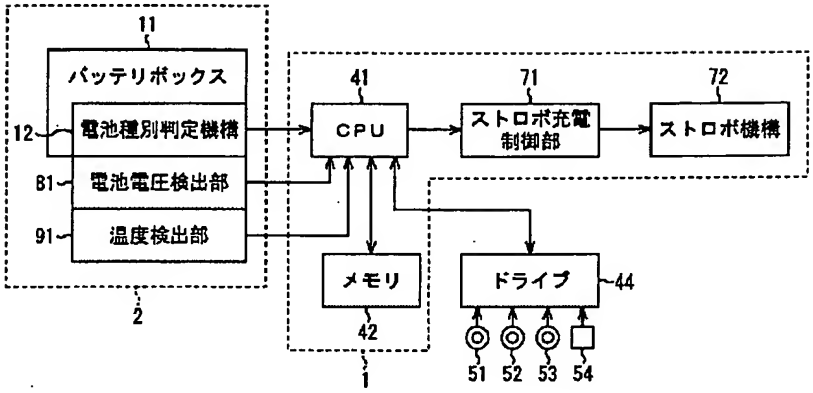
[Drawing 15]

図15



[Drawing 16]

図16



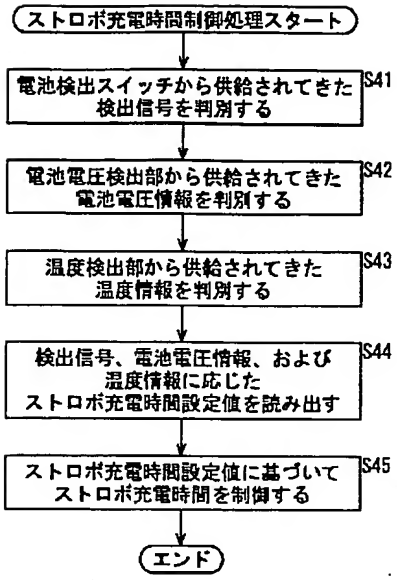
[Drawing 17]

図17

検出信号	検出電圧Vbatt	検出温度T	ストロボ充電時間設定値(秒)
OFF	Vbatt≧Vth	T≧Tth	E1
OFF	Vbatt≧Vth	T<Tth	E2
OFF	Vbatt<Vth	T≧Tth	E3
OFF	Vbatt<Vth	T<Tth	E4
ON	Vbatt≧Vth	T≧Tth	E5
ON	Vbatt≧Vth	T<Tth	E6
ON	Vbatt<Vth	T≧Tth	E7
ON	Vbatt<Vth	T<Tth	E8

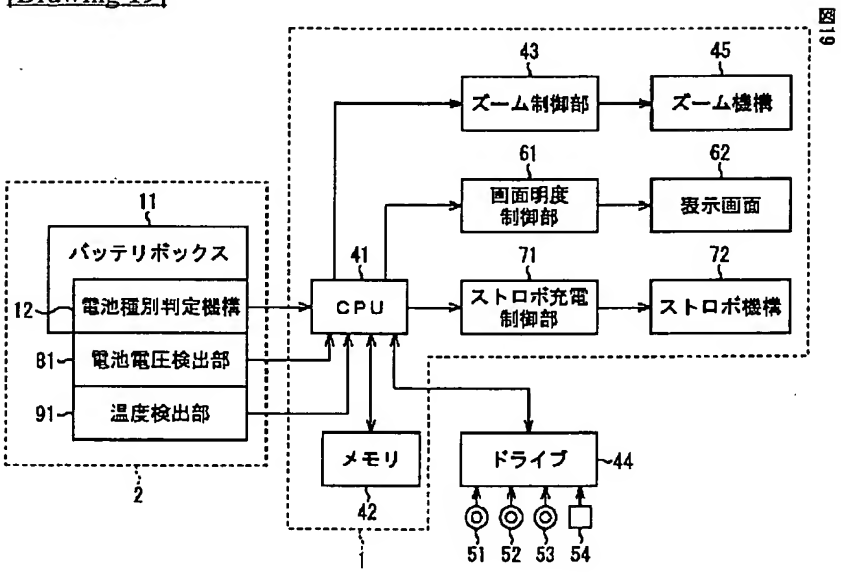
[Drawing 18]

図18



[Drawing 19]

図19



[Translation done.]